THE LIBRARY SERIES

UNIVERSITY OF TORONTO
3 1761 01793222 9

EDITED BY DR. R. GARNETT.

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/libraryconstruct00burguoft

The Library Series

EDITED BY

DR. RICHARD GARNETT

II

LIBRARY ARCHITECTURE

*

The Library Series

EDITED BY DR. RICHARD GARNETT

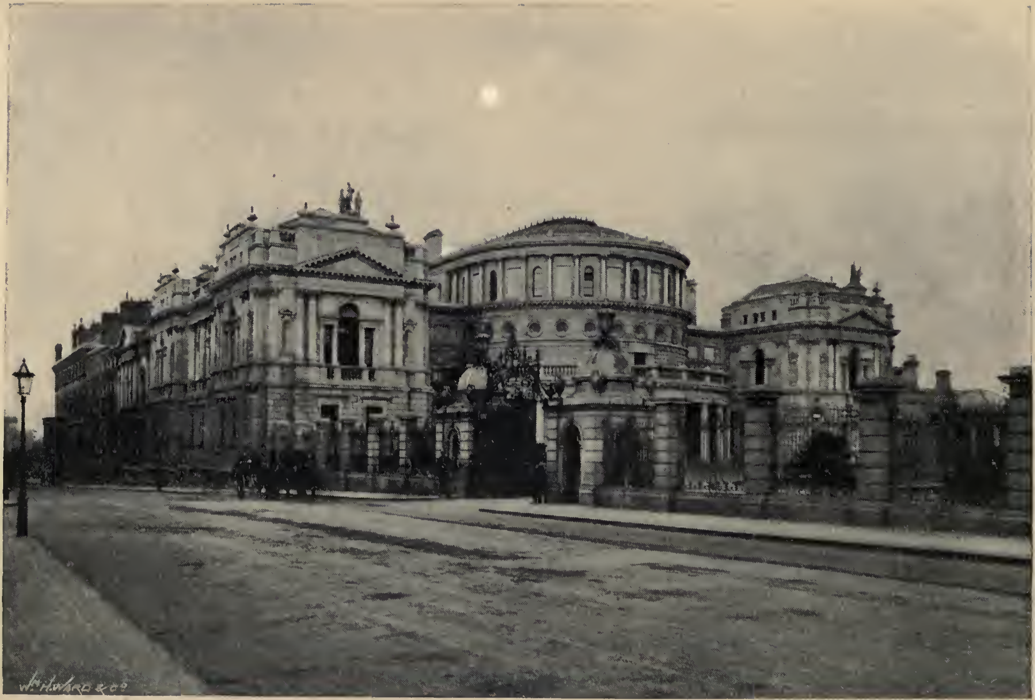
I. THE FREE LIBRARY: Its History and Present Condition. By J. J. OGLE, of Bootle Free Library. 352 pages, cloth, 6s. net.

II. LIBRARY CONSTRUCTION, ARCHITECTURE, AND FITTINGS. By F. J. BURGOYNE, of the Tate Central Library, Brixton. With 141 Illustrations. 356 pages, cloth, 6s. net.

In Preparation.

III. LIBRARY ADMINISTRATION. By J. MACFARLANE, of the British Museum.

IV. THE PRICES OF BOOKS. By H. B. WHEATLEY, of the Society of Arts.



THE NATIONAL LIBRARY OF IRELAND.

From a Photo by Mr. R. Welch, Belfast.

Lib. Sci.
B

LIBRARY CONSTRUCTION
ARCHITECTURE, FITTINGS AND FURNITURE

BY

Frank
F. J. BURGOYNE

44284
30/1/99

LONDON
GEORGE ALLEN, 156, CHARING CROSS ROAD
1897

[*All rights reserved*]

Printed by Ballantyne, Hanson & Co.
At the Ballantyne Press

EDITOR'S INTRODUCTION

THE development of libraries during the latter part of the nineteenth century may be compared with that of cathedrals and abbeys in Norman times, or that of colleges and grammar-schools under the Tudors. In all these cases the age, instinctively discerning its needs, partly by public effort, partly by private munificence, covered the land with edifices for their satisfaction. In so doing it necessarily gave rise to a number of architectural problems. That the libraries of the present day, however smaller in scale, may not be architecturally less honourable to their epoch than the corresponding constructions of the past, must be the earnest aspiration of all who regard them as among the characteristic monuments of the nineteenth century, and a most important manifestation of its intellectual activity. This ideal is the more difficult of attainment, inasmuch as obstacles now exist which were comparatively unfelt in the Middle Ages. The mediæval pious founder was frequently his own architect; at all events, paying the piper, he called the tune. In any case, there was a thorough community of feeling between him and the builders he employed. The builder was thoroughly broken in to his task, and entirely absorbed in it; since, from the inevitable slowness of mediæval operations, arising from the deficiency of capital and labour, the erection of an abbey or a college might be the sole occupation of a lifetime. Far different is it now, when the most extensive architectural undertakings seldom require more than three or four years, and the same architect is equally ready to turn out a church, a library, a theatre, or a bank. It is inevitable that in the absence of special knowledge of and special devotion to a particular style of edifice, the sentiment of architectural display should gain the upper hand. Hence a continual conflict between the architect who desires a handsome elevation, and the librarian who aims at practical convenience; frequently determined by a committee endowed with no great feeling for either.

Parodying a famous saying, it may be safely affirmed that this state of things will continue more or less until architects are librarians, or librarians architects. It is, meanwhile, a very useful service to bring the parties together as near as may be, by the simple exhibition of what has been done; showing how difficulties have been met, and objects attained, occasionally even how they have been missed. Mr. Burgoyne has performed this service for both professions in this little volume, destined, in the Editor's judgment, to rank among the most valuable contributions hitherto made to library literature. By copious illustration, indicative of extensive research, he has shown how the problems incident to the accommodation of books, and the adaptation of all parts of a library to the public service, have been actually dealt with in the most civilised parts of the world. Librarians and architects are thus supplied with a number of models to choose from, and abundant hints for further development from the combination of the best points of existing edifices. With this will be found much valuable counsel respecting the organisation of a library in so far as the material fabric is concerned, including in this definition furniture and fittings, mechanical aids to efficiency, and protection from fire and other perils.

One important feature of a work like this is that it enables us in a manner to codify the maxims already deduced from experience. It will be found that there are many points upon which librarians are practically unanimous ; arrangements common to most of the leading libraries here described, other arrangements which they practically concur in rejecting. Such observations may be developed into a code of rules, extending gradually by experience, until, allowing for the inevitable differences in the special needs of the various libraries, all important points have the sanction of general consent. It is impossible to enumerate such details within the limits of a preface. One cardinal rule may be laid down, always to design with reference to the probable future of the library. If it is destined to perpetual insignificance, no particular provision is necessary ; but if to a great expansion, this should be foreseen and provided for from the first. A generous view should be taken of such a library, ample space for additions should be secured, and the plan should be so framed that any future accretion should be a legitimate and harmonious development of the original model. So liberal a procedure, however, is only practicable when and where the public library has established itself in the public consciousness as an institution of paramount importance. American libraries are planned on a larger scale than the British, and with more complete appliances, because the library and the librarian are more regarded in America than here. It rests with librarians themselves, and with national instructors generally, to raise the British conception to the American standard, and with the public itself to demonstrate the inadequacy of the existing libraries by copious resort to them. Should this come to pass, the subject of library architecture will gain greatly in importance, and as the nineteenth century has been an age of construction, the twentieth may prove one of reconstruction.

R. GARNETT.

PREFACE

THIS book has been written in the hope that it will be of service to those librarians, architects, and members of library committees, who have in hand the planning of new libraries, or the adaptation of existing buildings to library purposes.

As this is the first treatise written upon the subject, it cannot fail to have imperfections; but the numerous plans with which it is illustrated must prove of great value to all interested in the subject. Some of them have been specially drawn for this work, and others, more especially those of continental buildings, have been copied from works not often to be found in British reference libraries. The aim of the book has been the strictly practical and useful, and accordingly technicalities have been avoided as far as possible.

My most cordial thanks are due to many librarians and architects for information freely given, and the loan of plans and blocks for the illustrations.

FRANK J. BURGOYNE.

THE TATE LIBRARY,
BRIXTON OVAL, S.W.

CONTENTS

CHAPTER I

PAGE

THE EARLY LIBRARIES—SITES—ALCOVE AND STACK METHODS OF STORING BOOKS—ARRANGEMENT OF THE ROOMS—PLAN, ELEVATION, AND FAÇADE—DECORATION—DANGER OF FIRE, AND THE NECESSARY PRECAUTIONS—FLOORING . . . 1–25

CHAPTER II

NATURAL AND ARTIFICIAL LIGHTING—HEATING AND VENTILATION 26–38

CHAPTER III

METHODS OF SHELVING BOOKS—DR. POOLE'S PLAN FOR A LARGE LIBRARY—STORAGE CAPACITY OF A ROOM—CONSTRUCTION OF BOOKCASES IN WOOD AND METAL—BRITISH MUSEUM SLIDING BOOKCASE—SHELVING FOR FOLIOS—VIRGO'S BOOKCASE . 39–72

CHAPTER IV

PAGE

THE ELLIOT, COTGREAVE, DUPLEX, MORGAN, SIMPLEX, CHIVERS, AND BONNER INDICATORS—CARD-CATALOGUES—BULLETIN BOARDS—THE TELEPHONE AND TELAUTOGRAPH—PHOTOGRAPHY 73–94

CHAPTER V

FURNITURE AND APPLIANCES: TRUCKS, LADDERS, STEPS, BOOK-LIFTS, TABLES, EASELS, BOOK SUPPORTS, NEWSPAPER AND MAGAZINE RACKS, CHAIRS, NEWSPAPER STANDS, DUSTING MACHINES, ETC. . 95–127

CHAPTER VI

THE BRITISH MUSEUM 128–140

CHAPTER VII

BRITISH PUBLIC LIBRARIES: ABERDEEN, BELFAST, BIRMINGHAM, BLACKBURN, BOOTLE, BRISTOL, CHELTENHAM, DARLINGTON, DERBY, DUBLIN, EDINBURGH, GLASGOW 141–166

CHAPTER VIII

BRITISH PUBLIC LIBRARIES (*continued*): LIVERPOOL, MANCHESTER, NEWCASTLE-UPON-TYNE, PRESTON, ST. HELENS, WIDNES, WIGAN, WORCESTER . . 167–189

CHAPTER IX

PAGE

LONDON PUBLIC LIBRARIES: THE GUILDHALL, BATTERSEA, BERMONDSEY, BISHOPSGATE INSTITUTE, CAMBERWELL, CHELSEA, CLAPHAM, CROYDON, EDMONTON, HAMMERSMITH, HAMPSTEAD . . 190–217

CHAPTER X

LONDON PUBLIC LIBRARIES (*continued*): LAMBETH, POPLAR, ST. GEORGE'S (HANOVER SQUARE), ST. MARTIN-IN-THE-FIELDS, STREATHAM, WEST HAM, WESTMINSTER 218–238

CHAPTER XI

AMERICAN LIBRARIES: BOSTON, LIBRARY OF CONGRESS (WASHINGTON), THE MERCANTILE LIBRARY ASSOCIATION OF NEW YORK 239–266

CHAPTER XII

AMERICAN LIBRARIES (*continued*): THE NEWBERRY LIBRARY (CHICAGO), BUFFALO, MINNEAPOLIS, CORNELL UNIVERSITY LIBRARY, MILWAUKEE, THE PRATT INSTITUTE (BROOKLYN), THE PEABODY INSTITUTE (BALTIMORE) 267–292

CHAPTER XIII

PAGE

EUROPEAN LIBRARIES: BIBLIOTHÈQUE NATIONALE, PARIS; BIBLIOTHÈQUE ST. GENEVIÈVE, PARIS; STADT-BIBLIOTHEK ZU FRANKFURT; UNIVERSITÄTS-BIBLIOTHEK ZU HALLE; UNIVERSITÄTS-BIBLIOTHEK ZU LEIPZIG; KAISERLICHE UNIVERSITÄTS- UND LANDES-BIBLIOTHEK IN STRASSBURG; HERZOGL-BIBLIOTHEK ZU WOLFENBÜTTEL; THE VALLIANO LIBRARY AT ATHENS 293–313

APPENDIX

LISTS OF ILLUSTRATIONS OF LIBRARIES, WHICH HAVE APPEARED IN THE "AMERICAN ARCHITECT," "ARCHITECT," "BRITISH ARCHITECT," "BUILDER," AND "BUILDING NEWS" 314–326

INDEX 327–336

LIST OF ILLUSTRATIONS

NATIONAL LIBRARY OF IRELAND, DUBLIN, ELEVATION *Frontispiece*

FIG. PAGE

1. Interior of the Bodleian Library, Oxford 2
2. Plan of the old library at Wolfenbüttel 3
3. Santa's plan for a library 4
4. Plan of a library arranged on the alcove system . . . 10
5. Plan of the same area shelved on the stack system . . 11
6. Plan of the Königl.-Bibliothek, at Stuttgart . . . 20
7. Dr. Poole's plan for a library 46
8. The Tonks' shelf fitting 51
9. Shelf fitting in use at the new Record Office . . . 52
10. Library Bureau shelf-pin 52
11. Chivers' automatic shelf-bracket 54
12. Chivers' wedge shelf-bracket 55
13. Library Bureau steel book-stack 56
14. Halle University Library, section through stack-room . 58
15. Halle University Library, section through bookcases . . 59
16. Greifswald University Library, section through stack-room . 61
17. Göttingen University Library, construction of bookcase and gallery 62
18. Halle University Library, step and iron floor . . . 63
19. Amsterdam University Library, iron floor 64
20. British Museum, sliding press 66
21. Strassburg University Library, shelving for folios . . 68
22. British Museum, folio supports 68
23. British Museum, portfolio case for maps 69
24. Bibliothèque Nationale, Paris, table-shelf 70
25. The Elliot indicator 75
26. The Cotgreave indicator 77
27. The Cotgreave indicator book 79
28. The Simplex indicator 83
29. The Chivers indicator 84

FIG. PAGE
30. The Chivers indicator, enlarged 85
31. Card-catalogue cabinet 88
32. Card-catalogue drawer 90
33. Lambert's magazine frame, with movable titles . . . 91
34. Book-truck from the University Library at Göttingen . . 96
35–37. Cotgreave's automatic steps 97–99
38. Library Bureau step 100
39–41. Metal book supports 101–103
42. The Crocker book brace 103
43. The Barrett wire book support 104
44. Book-lift in use in the British Museum 105
45. Cable book-carrier in use at the Library of Congress . . 106
46. Reader's desk in use at the British Museum . . . 108
47. Reader's desk in use at the British Museum, movable portion 109
48. Library Bureau magazine rack 111
49. Cotgreave's wall rack for magazines 112
50. Cotgreave's table-rack for small magazines 113
51. Library Bureau table-rack 114
52. Bowry's newspaper file, open 115
53. Bowry's newspaper file, closed 115
54. The Banbury newspaper file 116
55. Walker's book-rack and slip-sorter 117
56. Ladder from the Royal Library, Brussels 118
57. The Victor ladder 119
58. Table-easel from the Newcastle-upon-Tyne Public Library. 120
59. Table-easel from the University Library, Göttingen . . 121
60. Table-easel for copying 122
61. Heathcote revolving newspaper-holder 123
62. Lambert's newspaper clip 124
63. Chivers newspaper-holder 125
64. Harvey dusting machine 126
65. British Museum, plan of Reading-room and Library . . 135
66. Aberdeen Public Library, plan of lending department . 143
67. Blackburn Public Library 147
68. Bootle Public Library and Museum, plan of ground floor . 149
69. Edward Pease Library, Darlington, plan 152
71. National Library of Ireland, Dublin, plan of ground floor . 154
72. National Library of Ireland, Dublin, plan of first floor . 155
73. National Library of Ireland, Dublin, section through building 157

FIG. PAGE
74. National Library of Ireland, Dublin, section through bookcase 158
75. Edinburgh Public Library, plan of lending department . 160
76. Edinburgh Public Library, plan of reference department . 161
77. Mitchell Library, Glasgow, plan of ground floor . . . 164
78. Mitchell Library, Glasgow, plan of first floor . . . 165
79. Manchester Central Library, plans 172
80. Manchester, Gorton Branch Library, plans 173
81. Manchester, Openshaw Branch Library, plans . . . 176
82. Newcastle-upon-Tyne Public Library, plan of ground floor . 178
83. Newcastle-upon-Tyne Public Library, plan of first floor . 179
84. Gamble Institute, St. Helens, elevation 183
85. Wigan Public Library, plan of ground floor . . . 186
86. Victoria Institute, Worcester, plan of library . . . 188
87. Guildhall Library, London, interior 193
88. Battersea Central Library, plan of ground floor . . . 194
89. Battersea Central Library, plan of first floor . . . 195
90. Bishopsgate Institute, London, plan of ground floor . . 199
91. Camberwell Central Library, plan 200
92. Chelsea Central Library, plan of ground floor . . . 202
93. Chelsea Central Library, plan of first floor 203
94. Croydon Central Library, plan of the lending department . 209
95. Edmonton Library, plan of ground floor 210
96. Edmonton Library, plan of first floor 211
97. Passmore Edwards Public Library, Hammersmith, elevation 213
98. Passmore Edwards Public Library, Hammersmith, plan . 215
99. Hampstead Central Library, plan 216
100. Tate Central Library, Brixton, plan of ground floor . . 220
101. Tate Central Library, Brixton, plan of first floor . . . 221
102. Tate Branch Library, South Lambeth, plan . . . 222
103. North Lambeth Library, plan 224
104. West Norwood Library, plan 225
105. Poplar Public Library, plan 226
106. St. George's, Hanover Square, Public Library, plan of ground 229
107. Tate Public Library, Streatham, plan 233
108. West Ham Technical Institute 234
109. West Ham Technical Institute, plan of library portion . 236
110. Westminster Public Library, plan 237
111. Boston Public Library, Mass., elevation 241

FIG. PAGE
112. Boston Public Library, Mass., plan of ground floor . . 245
113. Boston Public Library, Mass., plan of first floor . . . 247
114. Boston Public Library, Mass., interior of the Bates Hall . 249
115. Boston Public Library, Mass., book-waggon . . . 251
116. Boston Public Library, Mass., plan of second floor . . 253
117. Library of Congress, Washington, plan 259
118. Mercantile Library Association, New York, plan of lending library 262
119. Mercantile Library Association, New York, book-stack and delivery counter 263
120. Mercantile Library Association, New York, plan of reading-room 265
121. Buffalo Public Library, plan of ground floor . . . 270
122. Minneapolis Public Library, plan of ground floor . . 272
123. Cornell University Library, plan of main floor . . . 276
124. Cornell University Library, plan of third floor . . . 278
125. Milwaukee Library and Museum, plan of ground floor . 281
126. Pratt Institute, Brooklyn, plan of ground floor . . . 283
127. Pratt Institute, Brooklyn, plan of first floor . . . 286
128. Pratt Institute, Brooklyn, plan of second floor . . . 287
129. Pratt Institute, Brooklyn, delivery desk and stack-room . 289
130. Peabody Institute, Baltimore, plan 291
131. National Library, Paris, plan of ground floor . . . 294
132. National Library, Paris, plan of reading-room . . . 295
133. The State Library, Frankfurt, plan of ground floor . . 300
134. The State Library, Frankfurt, plan of first floor . . . 301
135. Halle University Library, plan of ground floor . . . 302
136. Leipzig University Library, plan of ground floor . . 304
137. Strassburg Imperial Library, plan of ground floor . . 306
138. Strassburg Imperial Library, plan of first floor . . . 307
139. Strassburg Imperial Library, section 309
140. Wolfenbüttel new library, plan of ground floor . . . 310
141. Valliano Library, Athens, plan of first floor . . . 312

LIBRARY ARCHITECTURE AND FITTINGS

CHAPTER I

EARLY LIBRARIES—SITES—ALCOVES AND BOOK-STORES—PLAN, ELEVATION, AND FAÇADE—DECORATION—PRECAUTIONS AGAINST FIRE.

THE libraries erected during the couple of centuries following the invention of printing differ considerably from the modern type of library building. Then the readers were few in number, and the student was ensconced in a snug alcove, founded on the traditions of the scriptorium. Suites of rooms were built with the idea that they would be used more as exhibition galleries than as store-rooms for books meant for study. Many examples of this type of building are to be seen on the Continent. Amongst them may be mentioned the Biblioteca Laurenziana, at Florence, designed by Michael Angelo about A.D. 1515; the most beautiful building of the Libreria Vecchia, at Venice, built by Sansovino in 1571; and the present home of the Vatican Library, Rome, built in 1588 by

Sixtus V. from the designs of Domenico Fontana. The latter, indeed, is a typical example; the great hall is a stately vaulted room, 232 feet in length, 48 feet wide, and 29 feet high. It is decorated with frescoes, and contains many magnificent specimens of sculpture, porcelain, and other works of art, but the books are placed in cabinets

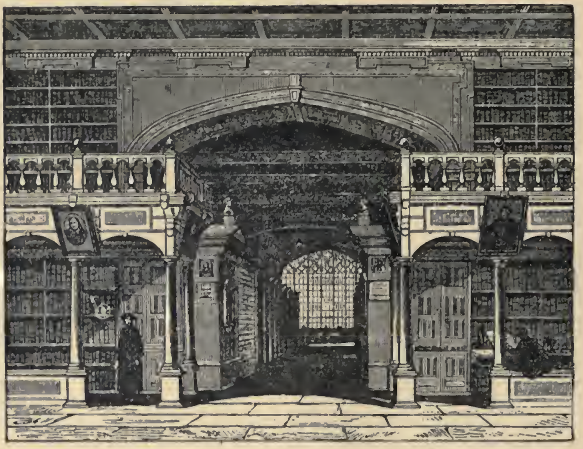


FIG. 1.—The Bodleian Library.

and presses, with doors, so that one might walk through the room without knowing the purpose for which it was really erected.

In these old libraries the method of shelving generally adopted was that of erecting high bookcases around the walls of each room. The nuisance of having to use long ladders to reach the top shelves would soon be felt, and so galleries were built around them at suitable heights. The oldest example of these early galleries (Fig. 1) still *in situ*, and used for the purpose at the present time, is to be found in the Bodleian Library at Oxford, built by Sir Thomas Bodley in 1597, and enlarged some thirty years later. Other instances of this style of architecture may be seen in the library at the Castle of Mannheim, the Court Library at Vienna, and the Monastic Library at St. Gall. The Radcliffe Library at Oxford, designed by Gibbs in 1740, which is now used as a reading-room for the Bodleian, is notable, also, as one of the earliest instances in England of a circular library lit from the roof. An earlier Continental example, from which Gibbs is said to have copied his design, is that of Duke Anton Ulrich at Wolfenbüttel (Fig. 2), which was built by Korb about 1710.

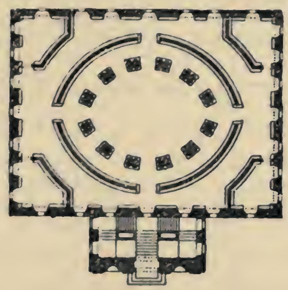


FIG. 2.—The old library at Wolfenbüttel.

The first architect to plan a library which in any way meets the modern requirements of giving ample shelf accommodation was Leopoldo della Santa, who in 1816 published at Florence a quarto pamphlet, with the title *Della costruzione e del regolamento di una pubblica universale Biblioteca, con la pianta dimostrativa.* It is interesting to recall this early attempt to construct a building entirely from an utilitarian point of view (Fig. 3). He takes for his site a rectangular plot, with light on all four

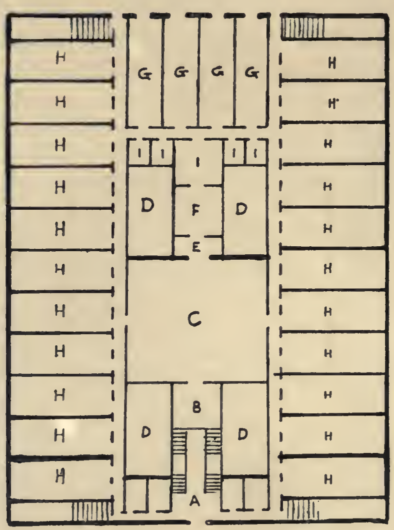


FIG. 3.—Santa's plan for a library.

A. Entrance.
B. Hall.
C. Reading-room.
D. Open courts.
E. Superintendent's office.
F. Catalogue room.
G. Choice and rare books.
H. Ordinary books.
I. Offices of librarian and his assistants.

sides. The entrance is placed in the middle of the narrowest side, and leads to a reading-room in the central part of the building one-third the width of the site, and lit from four open courts and the roof. The portion of the site behind the reading-room is cut up into small rooms for the staff and for the shelving of the rarer books. The remainder of the site on left and right of the reading-room is entirely devoted to two book stores, which extend from the front of the building to its rear, and are planned to shelve the books in double cases, placed at right angles between each window. This design, however, was never carried into effect, although it received the commendation of Vincenzo Follini, librarian of the Magliabecchian Library, and of Molbech, librarian of the Royal Library at Copenhagen.

The provision of a suitable site lies at the foundation of a satisfactory library building. A poor building may indeed be built upon the best site, but it is certain that a well-adapted library cannot be expected if the area on which it is to be built is cramped and irregular. In choosing a site, there are three questions which should be asked about it—

(1.) Is it suitably placed for the readers who are likely to use it?

(2.) Is there space sufficient, not only for the present needs of the readers and stock of books, but for its future growth and extension?

(3.) Are the surroundings likely in any way to interfere with the comfort of the readers, or the safety of the building and its contents?

In considering the first of these questions, the general trend of the population is a good guide. Most towns and cities have some recognised centre—a main street, municipal buildings, town hall, post office, or railway station—and it will be natural to look for a site near one or all of these. Care should be taken, however, to select one which, while as central as possible, shall not be unsuitable because of the noise of heavy and continuous street traffic, or the whistling of locomotives and shunting of trains. In some cases a site may be obtained sufficiently ample to allow the building to be set back, and so minimise what many libraries have found to be a great and irremediable nuisance. Quiet is one of the first requirements of a library, and every effort should be used to obtain it.

The second consideration, that of space, not only for present needs of both readers and books, but for future growth, is often but little considered. In many towns expensive buildings, which should last at least a hundred years, have been erected, covering the whole of the ground available, and it has been found in ten years, or even less, that extension is needed, and there is no possibility of shelving more books, or of giving accommodation to the increasing number of readers. Committees new to library work often have no idea of the rapid growth of their libraries. The following table strikingly illustrates the rapid increase both of books and of readers in a few of the representative British free libraries :—

Table showing stock of books in Central Library only.

Town.	At end of the Years				
	1875.	1880.	1885.	1890.	1895.
Birmingham .	57,081	Burnt out in 1879	104,286	132,732	155,633
Bolton . .	37,235	45,466	55,121	68,061	83,679
Cardiff . .	8,310	11,810	18,302	33,509	55,080
Glasgow . .	...	33,019	62,382	87,193	116,000
Leeds . .	37,464	52,711	73,023	84,930	99,090
Liverpool .	60,808	72,406	86,429	96,689	108,279
Manchester .	55,000	70,000	82,000	95,400	107,000
Nottingham .	20,579	27,108	51,366	68,535	81,436

Table showing the number of books issued in the Central Library only.

Town.	For the Years				
	1875.	1880.	1885.	1890.	1895.
Birmingham .	365,251	410,100	614,428	621,460	641,371
Bolton . .	194,102	240,708	264,421	318,653	443,909
Cardiff . .	26,076	54,171	91,372	137,204	179,781
Glasgow .	...	390,732	468,056	Removed to new premises	513,456
Leeds . .	275,882	362,299	501,766	431,436	504,989
Liverpool .	517,393	577,772	650,152	619,748	619,259
Manchester .	61,213	203,194	283,232	307,785	416,100
Nottingham .	143,096	160,562	319,573	333,807	397,446

The central libraries at Manchester, opened in 1852, at Leeds, opened in 1872, at Glasgow, opened in 1877, have all outgrown their original buildings, and have had to be removed into others; and those of Birmingham, opened in 1866, and Liverpool, opened in 1853, have had to be enlarged by the absorption of adjoining properties.

In considering the size and shape of a site necessary for a town's library, no hard and fast rule can be laid down. It will be self-evident that a deep site, extending far back, and surrounded by other buildings, with but a narrow street frontage, will only allow of a building being erected upon it one storey in height; while a site of the same shape and area, with its long side fronting the street, will allow the erection of a two-storied building, with ample light to all its rooms. A corner site is, of course, preferable to the same area enclosed, and one bounded by streets or open spaces on all of its sides is better still if it can be obtained. Much will depend upon the accommodation required in the building. A town's library should give the public at least a reference department, a lending department, a reading-room or rooms for newspapers and magazines, and the necessary working rooms for the librarian and his staff.

To these may be added separate reading-rooms for boys, girls, and women; an inner reading-room for students; lecture hall; museum and art gallery; residences for the librarian and the caretakers; strongroom for the safe keeping of MSS. and incunabula, or local collections; and rooms for binding and repairing. In the Birmingham central library, space for the growth of the library proper has been obtained by the transfer of the museum and art gallery, and the patent specifications, &c., to another building, and dedicating the whole of the space thus obtained to reference and lending library purposes only; but even this relief is almost outgrown. Although these alterations were only made in 1880, more shelf room for books will be wanted at no very distant date.

The third consideration, that of the surroundings of the library, is also important. If possible, it should be detached from all other buildings, and so diminish the risk of damage by fire, and annoyance from noise to a minimum, and allow the free access of light and air. In some places these requirements have been happily met by erecting the buildings on plots adjoining open spaces which will never be built over, such as recreation grounds, disused city churchyards, or public parks.

The public rooms of a library should not exceed two storeys in height, unless a constant elevator service can be secured. A corner site containing 10,000 square feet will afford accommodation for 150 readers of newspapers and magazines; a lending library of 50,000 volumes; a reference library of 150,000 volumes, with 100 readers; together with librarian's office, and proper accommodation for the staff. In calculating the probable shelf capacity of a site, the question of book storing or warehousing, as compared with shelving the books where the public can see them, must be considered. The general type of library building which has come down to us from the Middle Ages is that of a large and lofty hall, with shelving around it to the height of 10 or 12 feet, and above that a gallery or galleries, with similar tiers of shelves. When more accommodation for books was wanted than the wall-shelving gave, it was provided by the addition of bookcases placed at right angles to the walls, and projecting therefrom some 10 or 12 feet into the room. These formed alcoves, and generally tables or desks for the readers were placed in them between each bookcase.

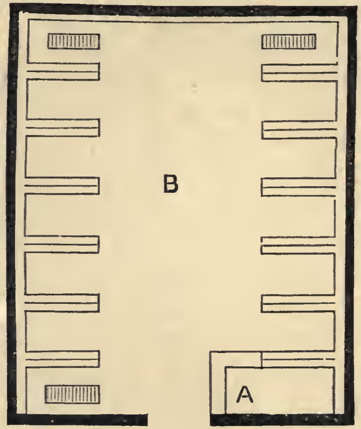


FIG. 4.—Plan of a library arranged on the alcove system.

A. Catalogue counter and attendant's desk. B. Space for tables for readers.

No one can deny the fine effect of a library arranged upon this plan. Those who have seen the Guildhall Library, London; the library of Trinity College, Cambridge; or of the Peabody Institute, at Baltimore, know that the result is a room which satisfies the eye, and impresses the imagination. But the waste of space in the centre area is enormous, and its shelf capacity is limited.

The opposite extreme is a plan which provides simply for book storage or warehousing, and is obtained by arranging the bookcases in a separate room away from the readers. The walls are first shelved, generally with shelves deep enough to take the quarto and folio books. Then, separate bookcases, shelved on each side, are placed at a distance of about 3 feet from each other, at right angles to the longest side of the room, with passage ways from the issue counter about 6 feet in width. The accompanying plans fully illustrate the difference

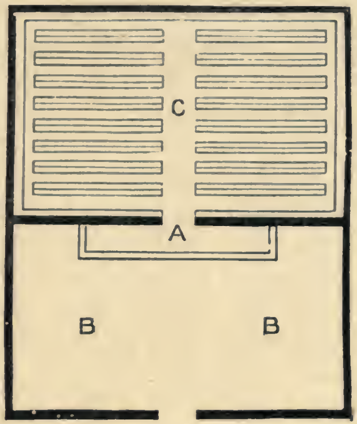


FIG. 5.—The same area as in Fig. 4 arranged on the stack system.

A. Catalogue counter and attendant's desk. B. Space for tables for readers. C. Separate room for books, with double the shelf room shown in Fig. 4.

of the two systems. Fig. 4 is the plan of a library arranged with alcoves, and Fig. 5 the plan of the same room divided into book store and reading-rooms, and arranged upon the stack system.

An examination of these two plans will show that in each case there is practically the same area available for readers, while the shelf capacity of Fig. 5 is quite double that of Fig. 4. If the alcove system is used for public libraries, it is necessary to have locked doors to the cases, and the greater distance for the attendants to go to obtain the books inquired for, combined with the delay caused by locking and unlocking the doors, materially affect the service. There is also much discomfort to the readers who go into an alcove to be out of the way, and have their attention distracted by the passing to and fro of the attendants. Supervision of the tables in the alcoves from the catalogue counter is impossible, and opportunities for theft and mutilation of books are provided, without much chance of discovery. The initial cost for shelving in the alcove system is greater than in the other, for it is generally necessary to provide bookcases for the whole room at the inception, while in the second plan they can be added as required, until the room is filled.[1] In Fig. 5 no doors are required for the bookcases as a protection from theft, and as they are out of sight, they can be built without ornament, and of the plainest materials consistent with durability and neatness.

---

[1] The question of the number of books that can be shelved in a given space will be fully considered in the chapter on "Library Fittings."

The greatest disadvantages of the alcove system are felt in large libraries, where it is necessary to erect five or six galleries for the books. In cold weather, when artificial heat is used sufficient to warm the lower stratum of air and make it comfortable for readers, a continual current of heated air will rise to the top of the building, and slowly roast the unfortunate books shelved there. If open gas-burners are used for lighting, their condition is worse. The products of combustion ascend, and the leather bindings rapidly deteriorate and rot into powder. Some of this decay, however, proceeds from other causes, for many of the leather bindings in college and other libraries, where gas is not in use, have been noticed to be similarly affected.[1] Damage is also caused to books by the dust consequent upon the daily cleaning of the readers' part of the hall. In Fig. 5, where the books are in a separate room, the only dust is that made by the few attendants, and so the wear and tear from this cause is reduced to a minimum.

A full consideration of the principles and faults of the two systems lead to the conclusion that for a library which can afford to allow its readers access to the shelves the alcove system is the best, especially where, as in university libraries, the number of readers is limited. But a large public library should have the bulk of its books shelved on the stack system, in book stores adjacent to the readers' room; but this may have a wall case around it for the most popular works, open for use without the formality of filling up a reader's ticket.

---

[1] A valuable paper upon this subject, by Mr. C. J. Woodward, entitled "Some Experiments as to the Influence of Gas on Bindings," will be found in vol. v. of the *Library Chronicle*.

The elevation or façade of a library building should, as far as possible, be in keeping with the object for which it is erected, although there is always a difficulty in making the outside characteristic of the use to be made of the interior. The façade of the portion used for the staff and administrative rooms may indeed differ from that of the book stores and reading-rooms, as the best light for the former may be obtained from windows differing in size and shape from those used in the latter. This has been done in the public library at Athens (Fig. 141), where the central block, in which is placed the reading-room and administrative portion, is accentuated, and the two wings, which are used as book stores, form inner blocks set back from the frontage of the centre.

In large libraries the plan of placing the public reading-room in the central portion of the building seems, on the whole, the best, although it necessitates grouping the books around it, and so many will be shelved at a greater maximum distance from the delivery desks than would be the case if they were all placed on one side only of the reading-room. The book stores should be in direct communication with the reading-room, and should be so arranged that the attendants will not have to cross over any portion of the building used by the public to obtain a book.

The decoration of the interiors of libraries should in all cases be severely simple, and kept subordinate. The book stores, to which the public are denied access, do not require much decoration, and if severe economy is necessary, the brick walls may be left exposed to view, without even covering them with plaster. It should always be remembered that the use and storage of books is the *raison d'être* of the building, and that if the public rooms are so ornamented and decorated as to become show-places for sightseers, the readers will be disturbed, and the proper use of the library will suffer. In the new building of the Boston Public Library no expense has been spared to make the large reading-room, with its approaches, one of the finest in the world. The entrance hall and staircases have been decorated by Puvis de Chavannes, the greatest modern master of decorative design. Artists like Abbey, Sargent, and Whistler were commissioned to adorn the delivery and reading-rooms, and a magnificent temple of art is the result ; but the rooms are more suitable for a museum or art gallery than for study, the purpose for which they were built. The beauty of the place attracts numbers of visitors daily, who audibly express their admiration or criticism, and careful reading under such conditions is impossible. It is a pity that the mistake should have been made of attempting to so beautify this noble building that it shall be regarded by the average man rather in the light of an art gallery than of a place for literary work and study.

In arranging the rooms of a library, attention should be given to the probable use that will be made of them by the public. The most frequented parts, generally, are the rooms devoted to newspapers and periodicals, the room for boys, the lending library, and lastly, the reference department. If the library is on a busy thoroughfare, it should be remembered that the latter department must be located in the quietest part of the building. In a two-storey library the natural position of the rooms would be to place the lending library, newsrooms, and boys' rooms upon the ground floor, and the reference department and its book stores upstairs. The shelf accommodation required for the lending library will not be so great as that for the reference department, nor need such care be taken to give ample room for its future growth. The books in this department wear out quickly, and as many are of ephemeral interest, they do not require replacement. In our largest towns it is doubtful if a lending library of more than 50,000 volumes will ever be required, as, before that number is obtained, the annual withdrawal of worn-out and undesirable works will almost equal the additions. Another consideration upon this point is the provision of branch lending libraries and delivery stations. The experience of our larger towns show that the active sphere of work of a lending library does not extend more than a mile around it, and that branch libraries are necessary for the outlying and suburban districts of each town. It should, indeed, be an axiom that a

a

lending library is wanted for each 80,000 inhabitants, and the experience of towns like Birmingham, Bradford, and Nottingham proves that the suburban residents who become readers and use the branch libraries freely, are those who would but rarely visit the central library. An indirect benefit of the multiplication of branches is, that they promote the personal intercourse of reader and librarian in charge, to an extent which would be impossible if the work was concentrated in one building. In Manchester this principle of taking the books to the readers has been carried even further. There is no central lending library, but fifteen well-equipped branches, each containing from ten to twenty thousand volumes, have been distributed over the city with the happiest results.

The position of the librarian's office and the workrooms for the staff will depend greatly upon the size of the library. In some places the librarian seems to be considered as a kind of superior janitor or caretaker, and an attempt is made to so place his office that he can sit and watch the entrance hall and note each person entering the building. This is a wrong conception of a librarian's duties, and has come down to us from the dark ages, when it was thought a librarian's chief work was to preserve his books from the assaults of the would-be readers, instead of acting as a key to unlock the stores of his library. This old feeling is happily changing, and the readers are finding that the more "alive" a librarian is, the more useful to them he can be in assisting and directing their studies. In small libraries the librarian should be close to the delivery desk of the lending department, for it is there that his advice and opinion will be chiefly in request. In larger libraries, where a greater portion of the librarian's time is of necessity taken up with the administrative duties of his position, it will not be possible for him to come into close personal contact with the readers, but he should be so placed as to be readily available when wanted.

In small libraries, where the staff of attendants is limited in number, an attempt should be made to obtain some supervision of all the public rooms from a given point of vantage, say, the issue desk of the lending department. In some libraries this has been done by erecting one large room, shelving the books round the walls, and placing the newspapers and periodicals on tables and stands in the centre. This is a plan to be avoided if possible, for not only is the noise inseparable from the work of the lending department annoying to the readers, but the vitiated air of the room—if it is used at all largely—plays havoc with the unfortunate attendants, who have to respire it for nine hours or more each day. The lending library should in all cases be in a separate room. Supervision can easily be obtained by good planning and a liberal use of glass screens in the division walls. The plans of the Edward Pease Library, Darlington (Fig. 69), the Tate Public Library, Streatham (Fig. 107), the Westminster Public Library (Fig. 110), and the South Lambeth Library (Fig. 102), give examples of how this has been done on four sites of different shapes and areas.

Opinions are divided upon the question of supplying free sanitary and lavatory accommodation for readers. If the library is large, and can afford to engage an attendant, they are most useful adjuncts; but if they have to be left open without supervision, they will prove a nuisance in more senses than one. The provision of a lavatory for hand-washing only is almost necessary for reference libraries, and will repay itself in the better condition in which the books are maintained. A certain amount of dust seems inseparable from the reference department, and it is well to give the scrupulous reader an opportunity to remove it.

Safety from fire is a great consideration, more especially in the larger libraries, where special collections have been formed, or unique specimens of typography or art are stored. In such buildings the rooms for the staff and those used for the administrative work of the library should, if possible, be separated from the book stores. This has been done in the Royal Library at Stuttgart, which is planned in the shape of a capital T (Fig. 6). The central block is entirely administrative, and the reading-room is placed at the junction of the cross-piece with the upright. The book stores are situated on either side, right and left of the reading-room. Space for extension will be provided by building a return at each end of the cross-piece parallel with, and as long as, the central block. This plan admits of complete isolation of the books from all other parts of the building, and as they are shelved in two stores, one half of the stock is separated from the other half, and so the contingency of the total destruction of the library is further diminished. A dread of fire is by no means unnecessary, for history gives us many examples of almost irreparable loss. Without going far back, there may be mentioned the destruction of the Cottonian MSS. at Ashburnham House in 1731; and the Central Library at Birmingham in 1879, with its priceless

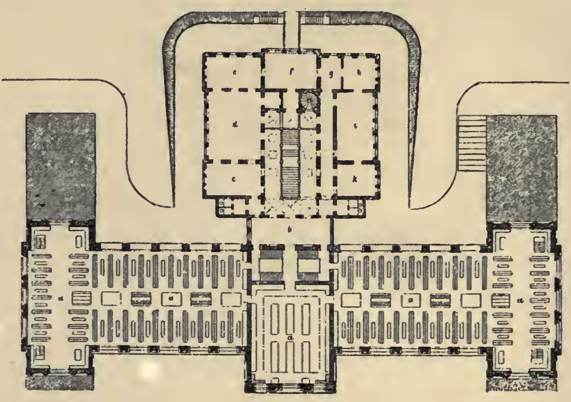


FIG. 6.—Königl. Bibliothek zu Stuttgart.

a. Book stores.
b. Vestibule.
c. Writing-room.
d. Reading-room.
e. Manuscripts.
f. Librarian's office.
g. Bookbinder.
h. Assistant-librarian.
i. Catalogue-room.
k. Porter.

Shakespeare and Staunton collections; the Welsh University Library in 1885; the library of Congress at Washington in 1851; and the University Library at Brussels in 1886. Fires have also recently taken place in the Newcastle-upon-Tyne and Manchester libraries, but fortunately without doing irremediable harm.

The National Library at Paris has for many years been in danger of destruction by fire by reason of its situation, as it is enclosed by four narrow streets in a busy commercial locality. Up to a short time ago, indeed, parts of the building were sublet for shops and dwelling-houses. It has been apparent to the authorities for a long time that the library should be removed, and plans were made for a new building, to be placed between the Louvre and the Tuileries. This for some reason fell through, and then an attempt was made to transfer the collection to the Luxembourg. This suggestion also was not carried into effect, and the custodians seem now to have arrived at the conclusion that they must make the best of their present site. Much of the old building, some of which was built by Mazarin, has been pulled down, and new reading-rooms and book stores erected worthy of the collection.

In the construction of a new library of any importance an attempt should be made to make it fireproof. Of course it is impossible to make a building which has to be artificially lighted and heated, and containing wood, paper, furniture, and other inflammable material, entirely so, but certain precautions may well be taken. The walls should be of terra-cotta or brick, and of a good thickness. The inner walls should be taken from the basement up to, and through, the roof, so as to divide the building into as many separate portions as possible. The book stores should be built in a series of rooms rather than in one large room, and all rooms should be separated by double iron doors, or, what is even better, thick doors of oak covered on either side with iron plates, with a space the thickness of the wall between them. The iron or steel girders and ties used in construction should in all cases be covered with terra-cotta or fireclay blocks, to keep the direct action of the flames from them. Due provision must also be made for their expansion under the influence of heat, for if this is not done, it is probable that, in case of fire, the outside walls would be pushed outwards, and the whole structure collapse. One of the many different methods of making concrete floors should be adopted for all floors and ceilings. Wood and felt should not be used in the roof, but iron, and some uninflammable non-conductor. In large libraries the heating apparatus, refreshment rooms, mess rooms for the staff, engines and boilers for the production of electric light, &c., should be separate and distinct from the main building, and connected with it only by corridors with iron doors. All wood used in construction should be chemically treated, and if dust-blinds are fitted to the bookcases, they should undergo a similar preparation. A well-considered scheme of fire-drill for the attendants should be in force, and telephonic communication, tested daily, should be laid on to the nearest fire-station. Provision should be made of hydrants upon each floor of the building, and buckets filled with water always be available. If the latter are placed in entrance halls, or where they may be exposed to severe frost, a handful of salt should be placed in each to keep the water from freezing.

The use of automatic fire-sprinklers in the book stores, unless applied solely to the floors, is only mentioned to be condemned, as the water would do almost as much harm to the books as a fire. The Mitchell Library, Glasgow, has adopted a simple method of precaution against damage which might result from sparks from fires in the adjacent buildings. Tubes have been taken up from the water-mains to the roof of the building, and are run along the tops of the ridges of the skylights. They are perforated with small holes, and upon turning a tap in the basement a powerful stream of water is forced through in the form of spray, which effectually wets the whole roof, and would keep in check, if not extinguish, the fire of any burning brands, sparks, or cinders which might fall upon it. In fixing such a system care must be taken to so arrange the levels of the pipes that no water can remain in them, but must drain away at or near the tap in the basement. If this is not done the imprisoned water will freeze in the pipes, and stop the passage at the time probably when it is most required.

One valuable security against fire may probably be found to be the cases invented by the eminent bookbinder Mr. Zaehnsdorf, for the protection of books of especial value. They have successfully borne the ordeal of an actual conflagration at the burning of Lord Carysfort's library, and have been tested with encouraging results by the present Keeper of Printed Books at the British Museum. On this occasion the only part of the paper charred was that actually in contact with the inside of the case, which would not have happened at all if the books tested had been bound. The expense of such cases is, nevertheless, a serious obstacle to their employment, but in practice it would probably be found that separate cases were unnecessary, and that it might even suffice to line the shelves with the incombustible material.

The flooring of the public rooms of libraries should be as noiseless as possible, and of a material that is warm to the feet, and capable of being readily cleaned. The entrance halls and lobbies will be best paved with mosaic or encaustic or glazed tiles. These should be of a light colour, for this part of the building is generally the worst lighted. Stone floors laid in large squares are not recommended, as they are apt to wear irregularly. Marble looks well, but has been condemned by many for its sonorousness.

In the reading-rooms and reference library wood is generally used. If it is not intended to cover the floors, the best floor will be one made of wooden blocks laid upon a cement foundation.

Pine and deal are most often used for cheapness, but they wear unsatisfactorily, and, if scrubbed much, soon show the grain and become ragged. Oak blocks are used in the Minet Library, and form a close floor almost impervious to damp and dirt. The most suitable covering for a wood floor is cork carpet or corticene : this can be obtained nearly half an inch thick, and it seems to consolidate with heavy traffic. A block floor is unsuitable for covering, as the sharp edges cut the material and cause it to wear. Covered floors should be made in the ordinary manner, and of well-seasoned wood that will not readily warp. Great care should be taken to see that the wood is dry and well-ventilated underneath before the cork carpet is laid upon it, for if it is done while the wood is at all green, dry rot will set in, and the floor be destroyed. For the same reason the cleaners should be cautioned against using too much water in cleansing floors of this character. Cocoa-nut matting and carpets are unsuitable coverings for rooms which are much used, and should not be placed in any of the public rooms.

CHAPTER II

NATURAL AND ARTIFICIAL LIGHTING, HEATING, AND VENTILATION

THE question of the lighting of the library, both by day and night, is most important. It is best to err on the safe side, and give too much natural light than too little; for it is an easy matter to subdue with blinds too great a light, but the initial mistake of a faulty natural lighting can only be remedied by the use of artificial illuminants or costly structural alterations, if indeed the latter are even possible. In designing a library the architect should adopt a style which will admit of high windows with square tops, for a square foot of clear glass two feet from the ceiling will admit more light than ten square feet at the same distance from the floor. This proposition is very elementary, but in how many cases do we see it forgotten, and the comfort of the readers sacrificed for an artistic but unsuitable elevation? A striking instance of this want of foresight is seen in the Dundee Free Library, designed by Sir Gilbert Scott. Here we have Gothic-pointed windows, suitable indeed to give the "dim, religious light" of a cathedral, but of little use for reading the small print of newspapers; and so the building, outwardly artistic and handsome, is internally a failure.

Side windows in the news-rooms should be placed as high as possible from the floors, so that the light may travel readily over the newspaper stands and racks. Double windows are advantageous when the library is within earshot of noisy traffic, and also in cold weather, as they diminish the draught caused by the hot air of the room chilling against the cold outside glass, the layer of air between the two casements being a bad conductor of heat. Windows should be in definite proportion to the size of the rooms they have to illuminate. If the library is situated in a street of ordinary width, and is not overshadowed by lofty buildings, there should be a minimum of 8 square feet for each 500 cubic feet of room space. On upper floors a slightly smaller proportion may suffice. In relation to this question the aspect of the library should also be considered; a room facing south will do with less window space than one facing north. Large squares of plate glass are better than the small panes or leaded lights so often used. It may sometimes be desirable to glaze the lower parts of the windows with tinted glass to prevent overlooking.

The best light for reading is that which comes from the left side of the reader, so newspaper stands and tables should be placed as far as possible at right angles to the windows. If light can only be obtained from one side of a room, its maximum width should not exceed 30 feet, and only be that if the room is lofty and the windows high up. The colour of the walls is an important factor, as dark colours absorb much of the light, while light colours reflect and diffuse the rays of light which fall upon them. A dado of glazed bricks or tiles around reading-rooms is of value, both from a sanitary point of view as well as that of helping to diffuse the light.

So far, we have considered the lighting of rooms by side lights only. A top light can be obtained in some of the rooms of most buildings, and its use is often advantageous. The readers can be arranged without regard to shadows, as all parts of the room are equally well lighted, and there is no limit to the size and shape of the rooms. The inconveniences of top lights are, the difficulty of keeping them rain-proof, and the draughts which are caused by the heated air ascending, chilling against the cold glass, and falling back again in cold currents. The first defect can be minimised by inserting clear glass windows in the clerestory only, and not in the slope of the lantern. The second can be met by an inner glass ceiling, which also has the advantage of intercepting the direct rays of the sun, and so keeping the room at a low temperature during the summer months. In the Edward Pease Public Library, Darlington, the roof of the reading-room is ceiled in this manner, with lightly-coloured stained glass. Each square is lifted about two inches from its bed by supports at the corners, and so allows free egress for the vitiated air, which passes through into the large open space between the ceiling and roof, and from thence into a ventilating shaft.

The best artificial lighting of a library is undoubtedly that by electricity; first employed, as is believed, at the Liverpool Free Public Library, and shortly afterwards at the British Museum. Not only does it keep the air pure, and at an even temperature, but it has no products of combustion, like those from gas, to rot the bindings of the books and dirty the decorations of the rooms. The expenses of installation and maintenance have debarred many libraries from adopting it, but in places where gas is high in price, it seems that there is but little difference in the cost. The experience of the Chelsea Public Library may be useful. The gas bill at the central library in 1891, 1892, and 1893 averaged £123, 2s. 10d. per year at 2s. 10d. per 1000 cubic feet. The electric light was then introduced, supplied by a company who charge 5d. a Board of Trade unit. The cost for 1894 was £134, 14s. 2d.; for 1895, £132, 8s. 9d.; and for 1896, £149, 4s. 2d. In addition to this charge, an outlay of about £3 yearly has been paid for new lamps. The initial cost of the installation was £325, and for this 218 lamps were fitted, about half being 16 candle-power, and the rest 8 candle-power.

The Newcastle-upon-Tyne Public Library is also lit by electricity. In this case gas is much cheaper than at Chelsea, the price being only 1s. 10d. per 1000 cubic feet. The initial expense of installation was £475. The number of lamps in use is 187, and the cost for the year 1896 was £190, as compared with a gas bill for the year 1891 of £95. The difference in cost, however, must not be closely compared, for several rooms are now used by the public which were not in use in 1891. It is estimated that the gas bill for the whole building would now be about £150.

In both these cases it will be seen that the electric current is obtained from a company. Some libraries, such as the British Museum, manufacture it for themselves. The experience of the Mitchell Library, Glasgow, which does this, is that the wages of engineer, and cost and repairs of plant, gas for engines, &c., amount to £350 yearly for an installation of 274 lights. This experience, and similar results elsewhere, seems to prove that only in very large libraries is it cheapest to produce the light if it can be purchased at anything below 8d. per unit. It may also be mentioned that if it is decided to make your own light, the machinery for doing so should be placed in a separate and detached building away from the library. If the works are placed in the basement, they will be found to be a nuisance from the vibration and noise caused by the working of the engines.

The system of lighting best adapted for libraries is that of a plentiful supply of 8 candle-power lamps, or larger, for the reading-tables, each provided with a separate switch, so that it can be turned off when not in use. For large and lofty rooms there should be provided, in addition, two or three arc lamps, with an opal shade or tray underneath, to reflect the light on to the ceiling, from which it will be deflected in a diffused form downwards over the whole room. A few gas lights should be introduced, especially on the staircases, for use if, from any cause, the electric light should fail.

On gas lighting little need be said. The forms of lighting which convey all the products of combustion away from the room into a ventilating shaft are undoubtedly the best. Sun lights, Wenham lights, the Incandescent system, and Sugg's burners, all have their advocates and opponents. It is much a matter of individual choice. But a word may be said as to the position of the lights, as they are generally placed much too high above the readers for the most effective use of the light. A height of 8 feet 6 inches from the floor will be found to give the best results.

The heating and ventilation of libraries is a question upon which much could be written. Taking all things into consideration, heating by hot water on the low-pressure system gives the most satisfactory results. Hot air and steam are used in many of the larger libraries, and are successful when the funds allow a competent engineer to be engaged to superintend the apparatus. The chief defects of heating by these systems are an extreme dryness of the atmosphere, and the charring of particles of dust and dirt by contact with the red-hot sides of the heating apparatus. These can be remedied by careful firing, the insertion of trays of water in the conduits, provided with louvres for deflecting the particles of dust floating in the air. A good form of heating small libraries by hot air is that provided by means of "Gill" stoves placed in the different rooms, but these necessitate the carrying of fuel and ashes to and fro, and so are undesirable for large libraries.

The British Museum is heated by hot air obtained through a shaft some sixty feet high. The air is drawn along by a rotary fan and heated over boilers, it then passes through a chamber provided with sprays of water for counteracting dryness. Under the central reading-room is a vast air-chamber, divided into long, narrow compartments, which radiate from the centre to the circumference, and each provided with hot-water pipes. The hot air enters the reading-room from inlets in these chambers, arranged at the end and top of each row of readers' desks. The room is lit by side windows and a lantern, the latter being double to protect the readers from draughts caused by the chilling of the hot air against the glass, and the upward current of the vitiated air is helped by means of coils of steam-pipes placed in the dome. The exits are the ordinary "Boyle" ventilators. Much of the success of the Museum heating depends upon the efficiency of the engineer. Without constant and unfailing watchfulness this extensive building would be most difficult to keep at an even temperature. As it is, complaints are not wanting. On one occasion a reader propounded to a stoker a theory of heating, founded upon the maintenance of a definite proportion between the warmth of the internal and external air, which demanded a reduction of the temperature to about 45° F. The attendant replied that his theory might be excellent, but he was sure that if he reduced the temperature to that point he would have his *readers* at boiling point !

In heating by hot water on the high-pressure system, small wrought iron tubes of $\frac{7}{8}$-inch bore are carried through the room from the furnace boiler. When the fire is lit the small quantity of water is soon heated, and a very rapid circulation, giving out great heat, is speedily obtained. This system is often adopted by architects, as the pipes are small and neater in appearance than those used in low-pressure systems. Its disadvantages are the danger of bursting, as the pressure will vary from 50 to 500 lbs. on the square inch ; a great liability of obstruction in the pipes through the water freezing during cold weather, when an explosion is sure to take place ; and the over-heating of the air in contact with the pipes nearest the furnace, and the consequent liability to fire, if by accident wood or other inflammable substances are in contact with them.

For the low-pressure system of heating by water, pipes of from 2 to 4 inches inside diameter are used. The water leaves the furnace boiler, which is placed at the lowest part of the apparatus, at boiling point, and circulates until it returns to the boiler, where it is heated again. The advantages of the system are that the risk of fire is reduced to a minimum, for no part of the pipes can have a higher temperature than 212° F.; and an equable temperature can be readily maintained, as the heat is easily regulated and controlled. The furnaces are economical, as any fuel capable of generating heat sufficient to boil water can be used. In fixing the pipes, a word of caution may be given against laying them in trenches in the floor with surface gratings. Not only is more heating surface necessary, for a great part of the heat is radiated into the brick channels which hold the pipes, but they are most unsanitary. Dirt, dust, and filth fall through the grates and collect around and under the pipes, where it is difficult to be removed, and as soon as the pipes get warm, a constant current of fine dust ascends with the heat and contaminates the air. Hot-water pipes should in all cases be run on brackets around the room, so that the dust can be wiped from them daily with a wet cloth. Radiators, or coils and stacks of pipe, should be fixed near the doors in entrance halls, and adjoining all fresh air inlets, to warm the air entering the building. The boilers and main pipes used to convey the water beneath the floors should be covered with some good non-conductor.

The ventilation of libraries is a difficult problem which does not seem to be yet solved. In this country but few libraries have adopted mechanical methods; nearly all rely upon natural ventilation, and the same inlets are expected to be as satisfactory in July, when the outside air is hotter than the inside, as in December, when the inside air is thirty to forty degrees warmer than the outside. It is self-evident that if the ventilation is satisfactory in summer, it cannot be expected to answer in winter. In considering ventilation, the first question should be, How much air is vitiated in each room in a given time for each person occupying it? A consideration of this point gives us an answer to the converse problem, How much fresh air should be allowed to enter the room per hour? The opinions of experts differ on these points, but it may be taken as a general rule, that in a room occupied to its maximum capacity, 25 to 30 cubic feet of air should be extracted per minute for each adult. A rough guide is given to us by our sense of smell, for if a room has the slightest perceptible odour, its ventilation is imperfect. The difficulty, of course, is to extract the foul air and introduce fresh without creating draughts. The method of doing so is practically the same in all systems, the use of a shaft with numerous inlets opening into it at the top of the room to withdraw the air, an upward movement in it being caused by the warmth of the vitiated air itself, or by the use of a gas-burner or a stove inserted in it. Corresponding inlets for fresh air are necessary, and must have relation to the outlets. They should be a little larger in area, and well distributed over the room. If but one or two inlets are provided they will cause a current of air to run directly to the outlets, creating a draught, and leaving stagnant air in other parts of the room.

The most suitable places for inlets are about seven or eight feet from the floor, and they should open upwards, so that the direction of the incoming air shall be towards the ceiling. The "Tobin" ventilation tubes are constructed on this principle, and seem to be one of the most efficacious of the various natural systems of ventilation in use.

The following table, which was compiled by the late Charles Hood, shows the cubic feet of foul air extracted by a ventilating shaft of an uniform area of 1 square foot—

Height of Ventilating Shaft in Feet.	Excess of Temperature of Air entering the Ventilating Shaft above the External Air.					
	5°	10°	15°	20°	25°	30°
10	116	164	200	235	260	284
15	142	202	245	284	318	348
20	164	232	285	330	368	404
25	184	260	318	368	410	450
30	201	284	347	403	450	493
35	218	306	376	436	486	531
40	235	329	403	465	518	570
45	248	348	427	493	551	605
50	260	367	450	518	579	635

As an example of the above, let us suppose a ventilating shaft 30 feet high, and the difference in temperature of the two airs to be 15°, then the discharge would be 347 cubic feet per minute; if the height be 40 feet, and the difference in temperature 20°, then the discharge would be 465 cubic feet per minute.

A system of mechanical ventilation, combined with warming, has been adopted in the Aberdeen Public Library, which the writer has had the opportunity of testing, and which is most satisfactory, both in summer and winter. The following account is condensed from a paper read by the librarian at the sixteenth annual meeting of the Library Association :—

The building consists of three main floors, each about 18 feet in height, and 75 by 45 in area. In the basement floor there is a small room, with an opening on one side to the outer air 36 square feet in area. All the air supplied to the building is drawn through this opening by a Blackman fan 5 feet in diameter, propelled by a gas-engine of three horse-power. The fan is placed at the entrance of a large duct, from which branch off other smaller ducts to the several floors. The incoming current of air is first drawn through a screen of manilla hemp, which is kept moistened by an occasional automatic flush of water, and so all dust, soot, and other atmospheric impurities are effectually excluded. In the winter this incoming current of air, after passing through the screen, traverses a large coil of hot-water pipes, and is suitably heated prior to entering the rooms. In the rooms, at a height of six feet from the floor, are oblong openings to admit the air thus screened and warmed. The outlets for vitiated air are grated openings, placed at intervals in the walls close to the floor ; these lead by several small shafts into one large central shaft, with exit at the roof of the building. When the apparatus is at work the fresh air is forced into the rooms, and circulates before it finds its outlet at the floor level. The entire air of the room may be renewed from four to nine times per hour, according to the speed of the engine. This is done without the creation of draughts, a lighted taper held but a foot away from an exit or inlet hardly flickering. It will be understood that all the windows are closed, and that no air can enter the building except by the action of the fan. The currents caused by the opening of the swing doors is outward rather than inward, owing to the compressed state of the internal atmosphere.

CHAPTER III

METHODS OF SHELVING THE BOOKS, AND CONSTRUCTION OF BOOKCASES IN WOOD AND METAL

IT is important to fully consider the different methods of shelving books, in order that the most economical arrangement may be adopted, and a true estimate of the maximum number of volumes which a library will hold be arrived at. Consideration has already been given to the difference between the alcove and the stack systems; this chapter will, therefore, be chiefly concerned with the question of the size, shape, materials, fittings, and construction of the shelves and bookcases. Bookcases may be of two kinds. In one the books are only shelved upon one side, the flat back being generally placed against the wall—these are termed "wall-cases"; in the second, the cases have shelves on both sides, and are placed in the centre of the rooms away from the walls—these may be termed "stack cases."

In considering what height the bookcases should be, we have, firstly, to endeavour to obtain some unit which may be divided by the shelves into spaces which will take the books without wasting room, and secondly, to consider what height is the best for ease of service, and an attempt should be made to combine the two. Nearly all modern libraries have their bookcases low enough to allow the books upon the top shelves to be reached without the aid of a ladder, or, at any rate, by merely using one step 8 or 9 inches in height, the general concensus of opinion being that some height between 7 and 8 feet is the most suitable.[1] Mr. Melvil Dewey in *Library Notes* recommends 7 feet 8 inches, and my own conclusion is that this or 7 feet 6 inches is the height that, on the whole, is best adapted for ordinary libraries.

The greater portion of the books now being published are octavo in size, varying from crowns to royals, or, say, from 7½ to 9½ inches in height. It seems probable that in the future the proportion of small books will be even greater than it is now. The days of folios, like those published from the fifteenth to the seventeenth centuries, are numbered, except as regards newspapers, and no publisher nowadays dreams of printing books larger than octavo unless they are illustrated, and space has to be obtained for plates, maps, or plans.

It is necessary to have a base from 2 to 4 inches high at the bottom of each case to prevent damage to the lowest shelf of books. In some libraries the base has been made higher, and the heating pipes have been taken through it. This is wrong in principle, for books require a low temperature rather than a high one, and great damage will be done to the bindings if the pipes are placed so near to them. In a case 7 feet 6 inches high it will be seen that with a base of 2 inches, and a top of 1 inch, there is left a space available for books of 87 inches. This will take eight shelves for ordinary octavo books, 10 inches in height, or ten rows of crown octavo books, 7¾ inches in height, allowing ¾ of an inch for the thickness of each shelf. If mixed sizes are wanted, each division will take five shelves for crown octavo, and four shelves for ordinary octavos; and if a few shelves for larger books are required, they may be obtained by dividing the space into two shelves of 8 inches, five shelves of 10 inches, and one of 14; but generally the taller books will be best shelved away from the smaller, as they are broader, and will require deeper shelves. The depth of shelf required for the ordinary octavos, whose height we have been considering, will be from 5½ to 7½ inches, so a shelf 8 inches in depth will be found to be sufficient. To recapitulate, we may safely say that 75 per cent. of the books in ordinary libraries can be placed upon shelves varying from 8 to 10 inches in height and 8 inches in depth.

---

[1] The height adopted at Stuttgart is 7 feet 4 inches; at Boston, 7 feet 5 inches; at Stockholm, 7 feet 8 inches; at the British Museum, 7 feet 10 inches; at the National Library, Paris, 8 feet 3 inches.

It is important that all shelves in the library be the same length, so that when it is necessary to remove part of any class to another place, the books may still keep their relative positions to each other. Another advantage is, that any spare shelf will fit any place where it may be wanted, and so it will not be necessary to keep a stock of shelves of varying sizes on hand suitable for odd places. Shelves are generally made of 1-inch wood, and when planed and ready for use may be taken as from $\frac{3}{4}$ to $\frac{7}{8}$ of an inch in thickness. With wood of this thickness it will be found that a shelf 42 inches in length may be used without it warping or sagging in the centre under the weight of heavy books. On the other hand, shorter shelves are better for keeping the books upright, and so we are led to the conclusion that for practical purposes a length of between 30 and 36 inches is the best.

The shelving for the folio and quarto volumes may well be provided in the wall cases. In constructing these it will be best to make the lower part of the case of greater depth, so that a ledge of about 8 inches in width may be formed at a height of, say, 3 feet from the floor. The total height of the case will, of course, be the same as the stack cases, but the depth of the top portion above the ledge should be 13 inches, and below 21. Cases of these dimensions will give accommodation for the largest books likely to be found in ordinary libraries, and if any of a larger size should be acquired, they must be placed in a specially constructed case.

We have spoken so far of one storey only of bookcases, 7 feet 6 inches in height; but if these are placed on the floor of a lofty room, it will at once be seen that similar rows may be built on the top of them, if a floor of thick hammered glass or perforated iron-work is placed between.

In this way are built the stack rooms of the larger modern libraries, and the most compact storage of the books, with ease of access to every part, is obtained. In the new building of the public library at Boston there are six of these book storeys; in the stack rooms, at the library of Congress, Washington, there are nine; but the general rule is to have four. At Boston but little reliance has been placed upon natural light, and it has been thought best to rely upon a plentiful number of electric lamps. In book stores lit only from the roof the light will no more than penetrate one floor, and so light but two storeys; if the gangways are of exceptional width, as in the British Museum, three storeys may be lit, but any greater number must rely upon side lights. If the latter be large and well arranged on two opposite sides, the book store may be 40 feet in width, but the length of the cases will depend greatly upon the size of the room and its lighting.

It has been already recommended that the bottom of the side windows in ordinary rooms should be 8 feet from the floor, so as to allow a continuous run of bookcases round the room, but in book stores with stacks more than two storeys in height this is impossible, and side windows must be provided for each storey. The stack cases will be placed at right angles to the windows, to allow the light to penetrate between them. The distance between each stack will depend upon the distance the windows are apart, the minimum being 2 feet 6 inches; but this width should only be adopted where space is of the greatest value. Passages 3 feet wide will in practice be found quite narrow enough. The central gangway running across the room between the ends of the cases must be wide enough to take the staircase which leads from one book storey to the next, and for a few narrow tables for standing books requiring replacement, &c. The staircase should be in straight flights and not circular, with a width of at least 4 feet. There should be a small lift for books placed near the door, and running from top to bottom of the room, so that books may be easily and readily transferred from one storey to another. If the book stores are very large and some distance from the readers, endless bands running over rollers or cable lines can be fitted along the gangways, to carry the books from the attendants in the book stores to the delivery desk. Examples of book railways of this kind may be seen in the new library of Congress at Washington (Fig. 45), and in the public library, Boston (Fig. 115).

The late Dr. Poole of the Chicago Library, while agreeing with this principle of shelving books, strongly objected to the stacks being more than one storey in height. His plan for constructing a large library was described in detail in a "Circular of Information" issued by the United States Bureau of Education in 1881, in which he said—

"My first requirement is a lot of ground 200 feet square, surrounded on all sides by streets, or, what is better, by other open space. On the middle of the side most appropriate for the main entrance I place the central building, 60 feet front and 75 deep, which will be wholly devoted to the administrative superintendence and work of the library. Here will be the offices of the librarian and heads of departments, the catalogues, the most general works of reference, and here the business of the library will be done. Here will be apartments for the cataloguers, and for unpacking and arranging books. The bindery will occupy the upper storey. The books will be stored not as now in one general repository, but in a series of rooms thrown out as wings from the central building, and extending around the lot. These rooms will be 50 feet wide, 16 feet high, and as long as it is convenient to make them. The width of the wings will be determined by the space that can be well lighted by side windows, and that can be spanned by iron girders without pillars. Ten of these rooms are shown on Fig. 7, and carrying the same construction four storeys high, there will be forty of these rooms in the whole building. Each of the rooms will contain the books on some special subject, or, in the early stage of growth, several related subjects. One room will be devoted to the fine arts, and will have the proper cases, tables, and other appliances for shelving and studying the large and expensive illustrated works which belong to such a collection. Another room will have the mechanic arts, while another will contain history. Political economy and social science will be found in another room, and so on through the different classifications of knowledge. These rooms will have no alcoves or galleries. The books will be shelved in wall cases and double cases not higher than a person can reach. High light will be taken on the exterior

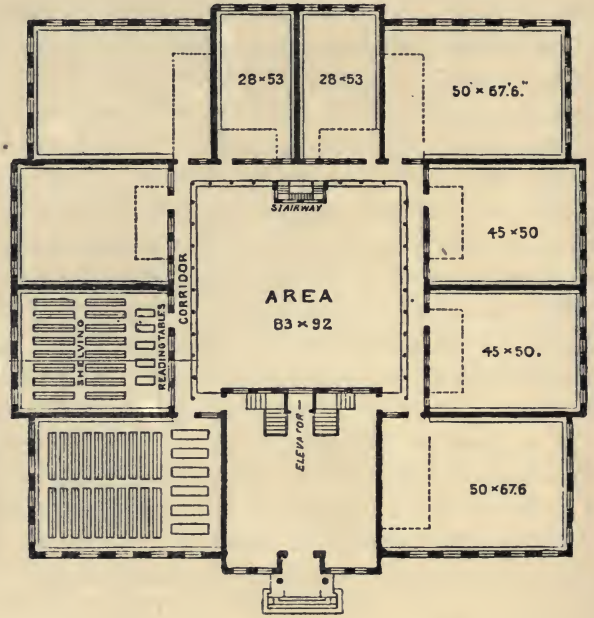


FIG. 7.—Dr. Poole's plan for a library building.

side from windows above the wall cases, and each room will have light from two sides, the reading desks and tables being on the inner side where there are no wall cases, and lit by windows of full length looking into the quadrangle.

"The attendant in charge will have an opportunity to become acquainted with the books in his department, and competent to assist readers in their investigations. There will be no need of a general reading-room other than one in which are kept encyclopædias, dictionaries, and general works of reference. When it is necessary, books can be loaned from one department to another, as they are now sent to the general reading-room. As a general rule, readers will go to the room which contains the class of books which they wish to study.

"As a protection from fire, each room used for the storage of books is cut off from every other room by a brick fire-wall extending through the roof, and every floor will be made thoroughly fireproof. The only access to the rooms will be by a light iron corridor at each storey, seven feet wide, running around on the inside of the quadrangle, as indicated on Fig. 7. If by accident fire should start in any one of these forty rooms, it could not endanger the safety of the other thirty-nine. In the rear of the central part of the building will be an elevator, which will land readers upon the level of any of the corridors; it will also have stairways, besides its elevator for reaching its several stories."

It will be seen that Dr. Poole's plan is practically that of the stack room system, with solid fireproof floors, and a distribution of the readers into separate reading-rooms, instead of concentrating them in one large room. One objection made to the stack system is that it is unsuitable for libraries where the readers are allowed to have access to the shelves, its principle being the warehousing of the books in the most compact manner, and not the provision of facilities for reading them. In the Amherst College Library this difficulty has been met by shortening the alternate stacks to a height at which they can be used as tables. But even this will only give accommodation for a very small number of readers; and if the general public are to be admitted to the shelves, some modification of Dr. Poole's plan seems likely to be the best. The loss of space is a serious objection to allowing the public access to the shelves at all; and the multiplication of reading-rooms is objectionable, as necessitating a similar multiplication of catalogues and books of reference.

To calculate how many books can be shelved in a bookcase, it is usual to allow 10 volumes to each foot of shelving for ordinary octavos, and 6 for folios and quartos. The average over the whole shelving of an ordinary collection of books will probably be 8½ volumes to the foot. If it is wanted to know how many books a room will hold if fitted with cases 7 feet 6 inches high, the method of calculation is a little different. Let us suppose that the case is 16 inches deep, and has books on each side; that the width of passage-way between it and the next case is the minimum of 32 inches; and that each shelf is 36 inches in length. The floor space that one division of one side of the case will take is half the width of the case (8 inches), plus half the width of passage-way (16 inches), multiplied by the length of the shelf (36 inches), which gives a result of 6 square feet. If the average number of shelves in the division is 9, and there are 8½ books to the foot, the capacity of the division is 230 volumes, or an average of 38 books to the square foot of floor area. In this calculation no account has been taken of the stairs, windows, doors, or cross gangway, and only a minimum width of passage-ways has been allowed. If space for these are taken into consideration, a conservative estimate of the shelving capacity of a room will work out at 25 volumes to the square foot. A book store, therefore, 50 feet by 40 in area, with cases 7 feet 6 inches in height, will shelve 50,000 volumes; and if the room be 35 feet high, and four tiers of bookcases are erected in it, its capacity is increased fourfold, to 200,000 volumes.

In the construction of bookcases and shelves wood has been generally used, but of late years iron has been introduced with considerable success. The advantages claimed for wood are that it is cheaper; it looks better; and, if the corners and edges are rounded, it does less damage to the bindings than any other material. It is contended for iron that it is fireproof; the stacks do not obstruct so much light as the solid wood cases; and that it allows free ventilation to the backs of the books. The latter (ventilation) is an important point, especially in the store rooms of large reference libraries, where long sets of books but little used are packed closely together, and are seldom removed from the shelves.

In hot climates metal has the great advantage of resisting the attacks of insects. Slate is used in the Fitzwilliam Library at Cambridge; and papier-mâché shelves might answer for light books, though we have not heard of its having been tried. It is unnecessary to have partitions running from top to bottom of the double cases dividing the shelves on one side from those on the other. The shelves, however, should not be made to go right through the case, but must be separate, so that if necessary the shelves on one side may be placed at different heights to those on the other. All shelves should be movable, in order that the utmost freedom may be obtained for the arrangement and classification of the books.

The shelves intended for the reception of rare works, or those valuable for their bindings, should in all cases be padded. In the British Museum all the shelves are covered with cowhide, and two square pads of leather are also provided for each shelf, to prevent the end books rubbing against the upright divisions. In some libraries where leather could not be afforded Canton flannel has been used, but this is not recommended, as it is a suitable habitat for moths. Falls should be of some cheaper material than leather, or they will hardly repay their cost; at the same time they must not be dust-traps. Roller blinds, which are fixed inside the top cornice, are in use in many libraries, and keep much of the floating dust away from the books.

If any of the bookcases are exposed, and have doors, provision must be made for ventilation ; this is best done by inserting wire netting in the panels instead of glass or wood.

The method of construction of a bookcase of wood, with fixed shelves, is too well known to need description. There are several appliances in use for allowing the shelves to be easily and readily moved. One of these is that shown in Fig. 8, and is known as "Tonks' Fittings." A groove is run at the back and front of each upright, and in this is screwed a strip of metal, perforated with oblong holes ¾ of an inch apart. A small square catch, with a piece projecting, is slipped into a hole, and stands out at right angles to receive the shelf, which rests upon four of these, placed one in each upright strip. This fitting allows the shelf to be raised or lowered at distances corresponding to the perforations in the uprights. In fitting, it is important to cut the grooves in the uprights deep enough to embed the whole of the iron strip; if not, it will project and damage the bindings.

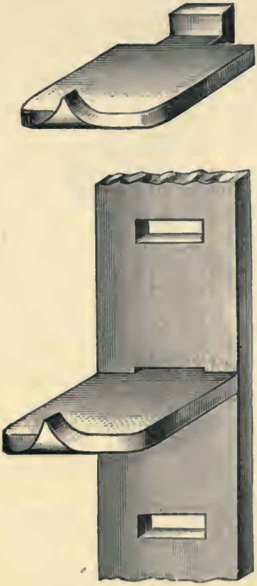


FIG. 8.—Tonks' shelf fitting.

In some libraries wooden pegs are used, driven into holes bored at regular intervals. These cannot be recommended, for they continually get loose and drop out, as the wood warps or stretches under the influence of heat or cold.

Fig. 9 shows the construction of the shelf supports used in the new Record Office, Chancery Lane, London. A hole is drilled in the iron upright, and a similar hole in the one side of a piece of stout angle iron. The latter is secured to the upright by a hollow bolt inserted from one side, into which is screwed from the other side a smaller solid bolt. The shelf is laid upon the top of the angle iron, and rests there securely. Objection must be taken to this manner of fixing the shelves, as the projecting surfaces both of angle iron and

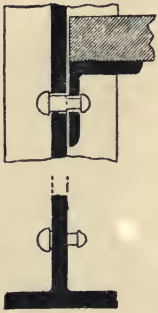


Fig. 9.—Shelf fitting, from the new Record Office.

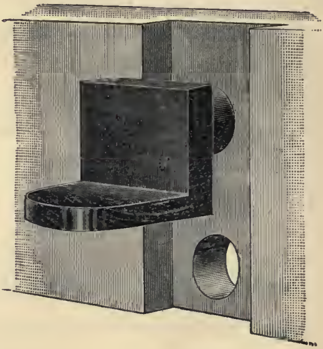


Fig. 10.—Library Bureau shelf-pin.

bolts are likely to damage the books placed against them.

The revolving shelf-pin, shown in Fig. 10, is that supplied by the Library Bureau. It is made of metal, and allows of adjustment to two heights from the same hole, the most usual being that shown in the illustration. The second adjustment is made by turning the pin with the projecting part uppermost. The holes for receiving the pin should be drilled in a groove broad enough to receive the square head, otherwise they may sag under the weight and slip out.

The Chivers' adjustable shelf fitting, shown in Fig. 11, consists of a metal strip and brackets. The strip is screwed to the inner side of the upright, and is raised a little from the surface by washers at intervals. The brackets which support the shelves slide up or down this strip as desired, and are held in position by an automatic device. This is one of the latest form of shelf bracket, and, as it gives absolute adjustability, it has considerable advantages over many of the contrivances in use. It has been adopted by the Hampstead Public Library, London Library, and the University Library, Aberdeen.

In Fig 12 is given an illustration of the wedge bracket. The construction will be apparent from the drawing. The bracket slides between uprights, and is held in place by two wedges, one of which has a serrated edge. When it is necessary to alter its position a smart tap given to one of the wedges loosens it, and it can then be slipped up or down as desired. The front of the

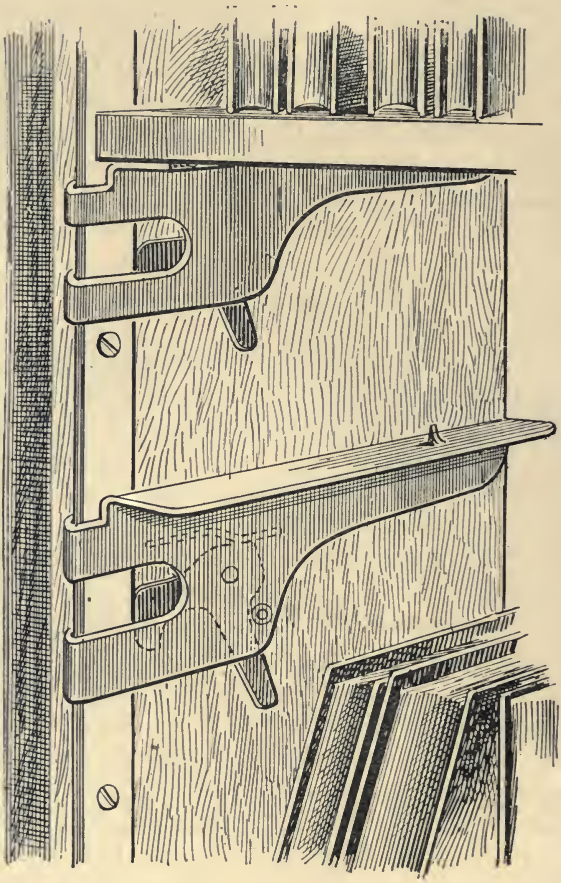


FIG. 11.—Chivers' shelf bracket and strip, as viewed from the back.

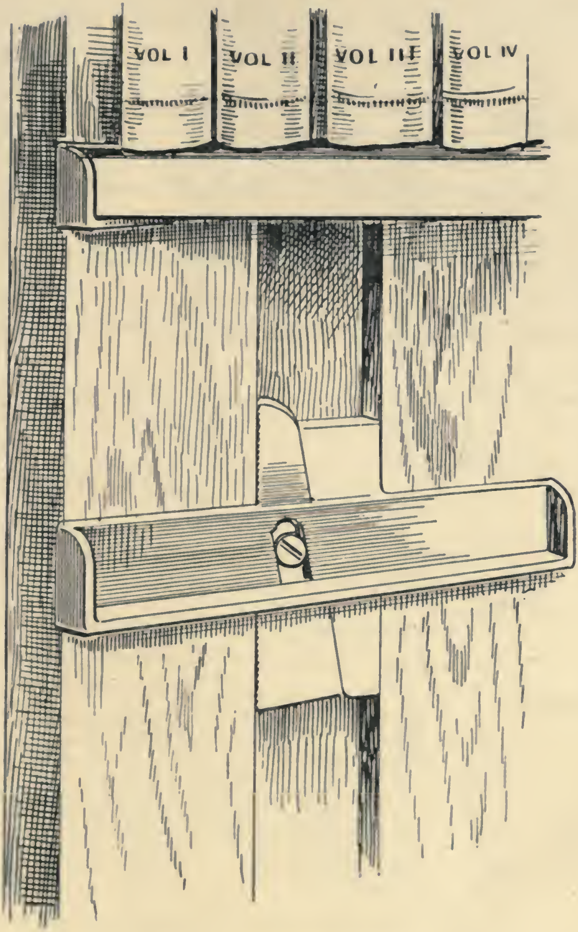


FIG. 12.—Chivers' wedge shelf bracket.

bracket is of metal, and is grooved or recessed to hold the shelf firmly and prevent it slipping.

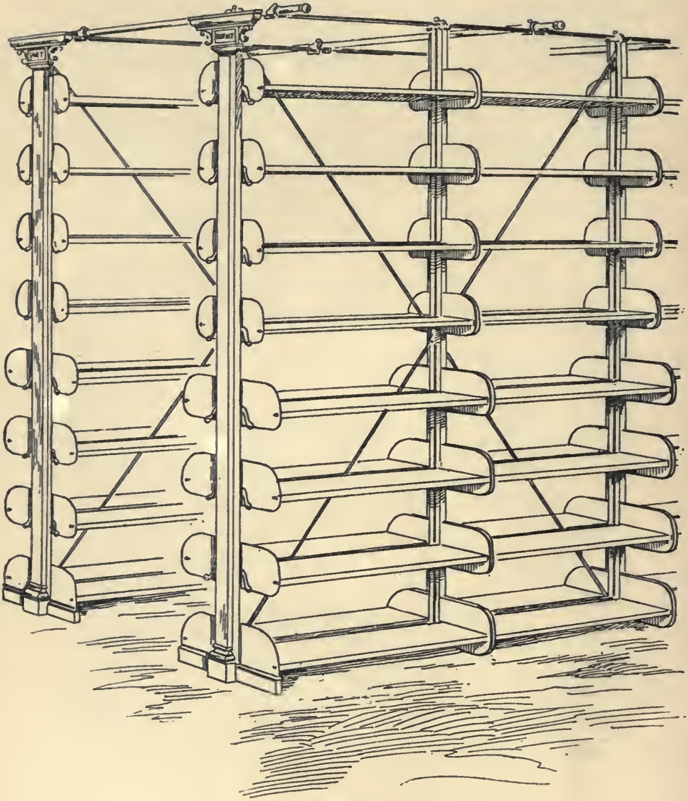


FIG. 13.—Library Bureau steel book-stack.

The Library Bureau steel stack, shown in Fig. 13, has uprights of cold rolled steel, about 8 feet high. These are grooved to carry brackets, which are held in place by keys, automatic wedges, or other devices. The shelves, which may be of wood or metal, are supported by the brackets at either side. The uprights sink into feet secured to the floor, and are tied together longitudinally at the top with tie-bars, and completed with ornamental finials. The exposed ends can be fitted with handsome pilasters, the capitals comprising a label-holder for class and case numbers, and the connecting bars forming an arch over the entrance to the alcoves.

Another form of iron bookcase is the "Lambert," which may be seen in the Worcester Public Library. The shelves rest upon brackets which slide upon an upright, and automatically lock when released.

A system of fire-proof library fixtures built up of steel and bronze has lately been introduced by the "Fenton" Metallic Manufacturing Company of Jamestown, New York. The uprights are formed of cold rolled steel plates deep enough to accommodate the shelf required, and are slotted at inch intervals to receive the shelves. The latter are made of steel, and have a bead or roll at the front, the whole being polished and finished with japan, thus giving the metal a smooth surface like porcelain.

In Fig. 14 is given a section of the stack room of the University Library at Halle, showing the arrangement of the bookcases and stairs; and in Fig. 15 is shown in detail, on a larger scale, the construction of the cases themselves. It will be seen that the stack room is lit from both sides by large windows, which give abundance of light, and that the only top-light is that obtained from a lantern over the staircase in the centre. More top-light was not used, as it was thought that damage to the books might arise from rain entering through leaks in the skylight. The windows are 3 metres wide, and are separated from each other by a wall space of 1½ metres. The cases are placed 1.60 metres apart, and are alternately at right angles to the centre of each window and of each wall space; each storey of the bookcases is 2.30 metres in height. To each upright of the bookcases is affixed a metal handle for holding

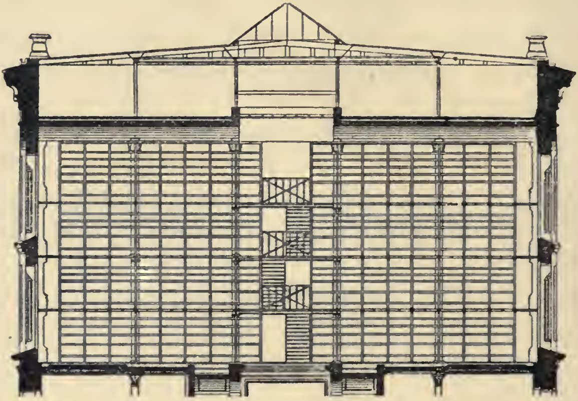


FIG. 14.—Section through the stack room of the Halle University Library.

while reaching a book from the top shelf. A step is also provided at the foot of each case; the situation of these are shown in Fig. 15, and the construction in Fig. 18. One defect, however, may be noted; the shelves are in one piece from back to front of the bookcase, and cannot be altered

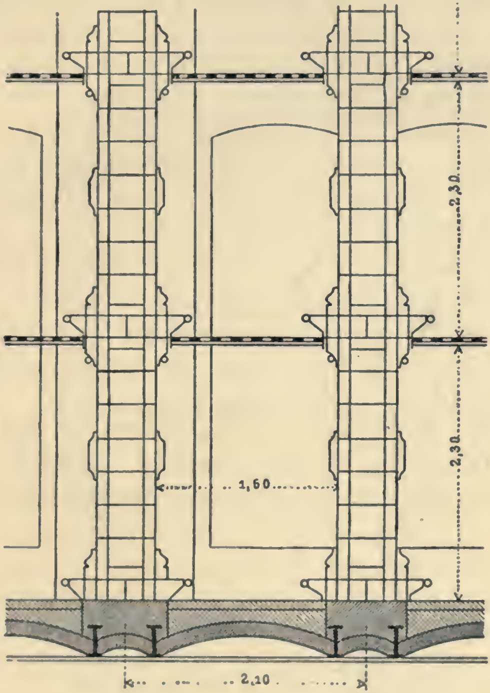


FIG. 15.—Section through two storeys of the stack room at Halle.

on one side without interfering with the other. This is a mistake, as of course it often occurs that the books on one side of a case are taller or shorter than those on the other, and so inconvenience and waste of space will frequently happen. In all double bookcases each shelf should have a separate bracket, rack, or pin arrangement for altering its height, independent of its fellow on the other side. The bookcases at Halle are eight divisions in width, and each division is 1 metre wide. The staircase in the centre of the book stack takes up 2 metres, the total width of the stack being about 20 metres. The floors are of perforated iron-work, and are arranged to fall opposite the centre of the windows, so that each storey has light from about 1½ square metres of window.

In Fig. 16 is given a section of half of the book stack in the University Library at Greifswald. It will be seen that two storeys of the stack are below the floor level of the reading-room, and four above. Light is obtained from a skylight in the roof and from large side windows, each of them being planned to light two storeys of the stack, the stone-work of the outer walls being placed opposite the floors. The cases vary a little in height, the five top storeys being 2½ metres, and the bottom one 2⅓. There is also a basement, 2 metres in depth, underneath the book store, to provide against the possibility of any damp arising from the ground and damaging the books. The cases are divided into five divisions, each a metre in breadth, and the stairs giving access to the different storeys are placed in the centre of the store.

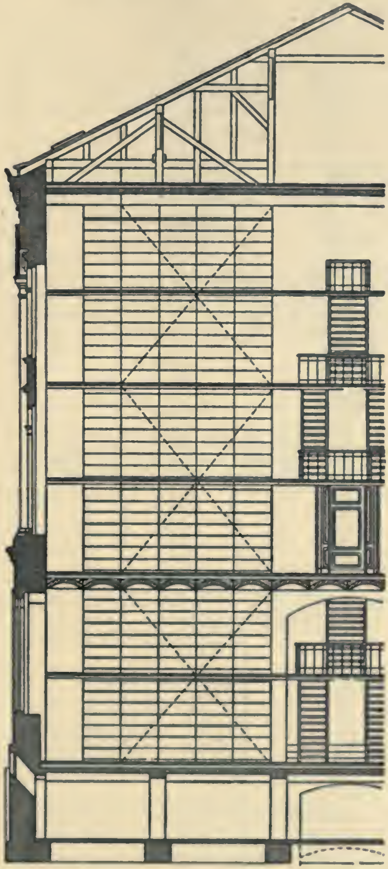


FIG. 16.—Section through the stack room of the University Library, Greifswald.

In Fig. 17 is shown the details of the construction

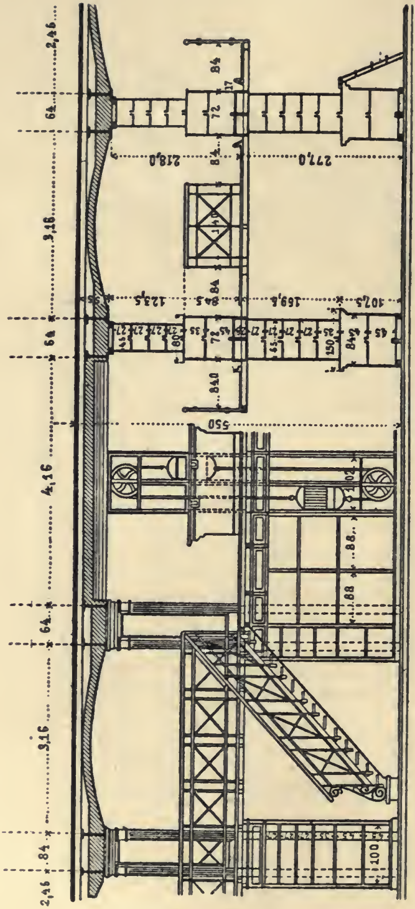


FIG. 17.—Section through the gallery and bookcases of the University Library at Göttingen.

of a bookcase and gallery and lift from the University Library at Göttingen. It will be noticed that there is no central division to the cases, and that each shelf has a thin strip of wood at its back to prevent the books being pushed through. This is a doubtful advantage, and may sometimes prevent the shelving of an oblong work, which would otherwise have stood upon the shelf and projected a little into the shelf-room of the adjoining division. A space is left between each case and the floor of the gallery for ventilation, and an iron rod is fixed, at a suitable height, at right angles to the floor, to prevent unwary feet from going through. In the Bibliothèque Nationale at Paris a space of 6 inches is left for the same purpose, but it is covered with galvanised iron netting. In the University Library at Halle a similar form of construction is used, but here the rod is encased in a strip of iron, which is screwed to the uprights, and forms a narrow step at right angles to the case. This allows an ample space for ventilation between the case and the flooring, with no liability to accident. Fig. 18 gives the method of fastening, details of one of the steps, and part of the perforated floor from the stack room at Halle.

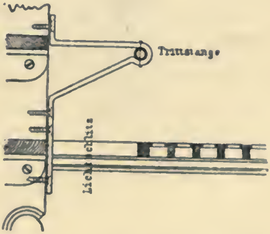


FIG. 18.—Step and iron floor in the University Library, Halle.

The construction of the iron floors of the book stacks in the new University Library at Amsterdam is shown in Fig. 19. The drawing is almost self-explanatory. It will be seen that great strength is obtained from the liberal use of rolled angle-work, and that the floor proper is made of squares of cast iron laid upon the angle iron framework.

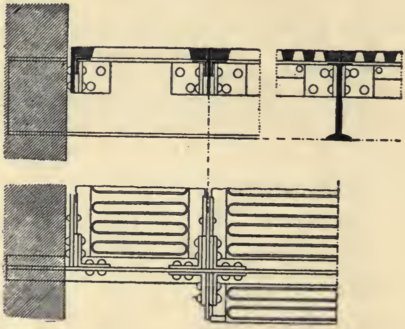


FIG. 19.—Construction of the iron floor of the book stores in the University Library, Amsterdam.

The stack rooms of the British Museum surround the central reading-room on all sides. They are divided into three storeys, each being 8 feet in height, and the bookcases are a similar number of feet apart. The floors separating the storeys are of perforated iron gratings, held upon iron girders half an inch in width and 4 inches in depth. In thirty years from the building of the reading-room the stack rooms had become congested, and further shelf-room was a crying necessity. The aisles were deemed too narrow for the erection of central presses, and the great cost of extending the building was almost prohibitive, to say nothing of the vast inconvenience of placing the books far from the reading-room.

The difficulty was solved in 1886 in an unexpected manner by the introduction of a series of sliding cases or movable presses, adapted by Mr. Jenner, assistant in the printed book department, from a system of supplementary bookcases hinged upon the presses in need of enlargement, the value of which had been discerned by Mr. Garnett, then assistant keeper of printed books, when he casually saw it in use in the Bethnal Green Free Library. It subsequently appeared that a somewhat similar plan had been introduced into the Bradford Free Library by the ingenious librarian, Mr. Virgo, but this was entirely unknown both at the Museum and at Bethnal Green.

A narrow iron ledge was bolted to a pair of the parallel iron girders which run at right angles across the top of the cases. In each groove thus formed two wheels run, from which are hung, at a distance of a few inches from the floor, a lightly-constructed case of iron-work, with shelves on both of its sides, as shown in Fig. 20. The whole weight of this "hanging press," as it may be termed, rests upon the wheels above. When not in use they are pushed up close to the fixed bookcases, and form a projection of about 16 inches from its surface, thus not materially interfering with the light.

When books from the inner side are required, the case is pulled forward on its overhead wheels for

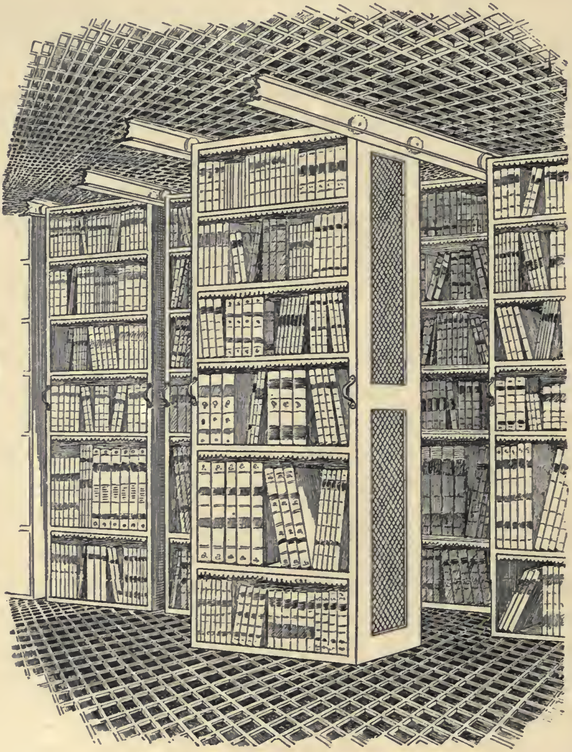


FIG. 20.—Sliding press, from the British Museum.

a couple of feet, the book obtained, and the case pushed back to its normal position. The weight of a case filled with books averages about 9 cwt., but they are so delicately poised as to be movable with but little exertion. In the lower part of the library the book capacity is trebled without inconvenience, for if one of the new cases is hung on each side of the ordinary 8 feet aisle, a width of 5 feet clear is still left in the centre for passage-way and light. A minor advantage of this system is its cheapness, for the new cases need only be supplied as required. They also meet the wants of more shelf room for any particular class of literature, which, through unexpectedly large additions, may suddenly need more room for its accommodation. Thus enormous space for the extension of the library has been obtained without taking in a single additional foot of ground.

The proper shelving of folio volumes is a difficulty often experienced. If they are placed on shelves of the ordinary width, and the shelf is not quite full, the volumes lean against each other, and speedily buckle the bindings, and allow dust to enter. The beau ideal of folio shelving is undoubtedly to lay each volume flat upon a separate shelf, but few libraries can afford the room necessary to so shelve a large collection of books. Fig. 21 shows a device used in the University Library at Strassburg. A fixed projecting ledge is made in a bookcase at a height of about 3 feet 6 inches from the ground, with a depth of about 24 inches, thus forming between each upright an open bin. A thin fixed shelf is fixed inside at a distance of, say, 6 inches from the top, and thin upright divisions are placed under it at distances of about 8 inches apart. This allows two or three folios to stand between each division, and two to lie on the top shelf. In Fig. 22 is shown a device used at the British Museum for holding upright the heavy volumes of newspapers. They are small V's of sheet iron, which are screwed to the under side of the top shelf; but with these great care has to be taken in replacing the volumes, or they are liable to be damaged. Fig. 23 is an illustration of a skeleton bookcase used in the British Museum for the large folio

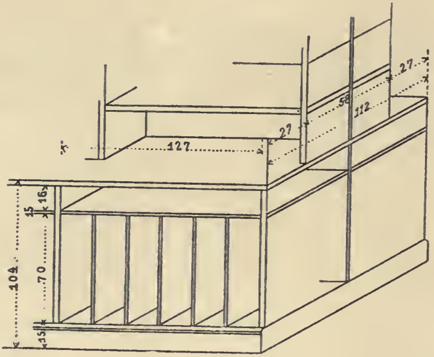


FIG. 21.—Shelving for folios, from the University Library, Strassburg.

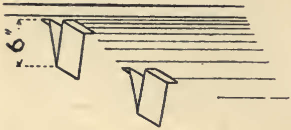


FIG. 22.—Folio supports, from the British Museum.

cases of maps, plans, &c. It will be seen that they slide on rollers, and so are easily withdrawn and replaced. In the sliding shelf used for the same purpose in the Bibliothèque Nationale, Paris, the edge of the shelf is grooved, and slides along a strip of metal fixed to the uprights of the bookcases. The back of the shelf has a slight projection at right angles, which acts as a stop, and prevents the book being pushed past the edge of the shelf.

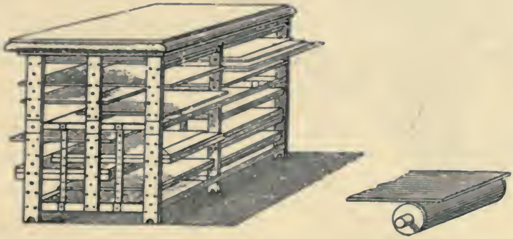


FIG. 23.—Portfolio case for maps, from the British Museum.

At the Liverpool Public Library the most valuable and handsomely-bound volumes are kept in bookcases with glass doors. The large folios lie flat on iron rollers covered with soft cloth, three of them forming a shelf. The rollers are removable, and can be adjusted to any height required. They have a central pin at each end on which they revolve, which fits into grooves made in strips of metal. Three of these are sunk into each side of the uprights of the bookcases, back and front.

In libraries where the readers are allowed access to the shelves, it is necessary to have shelf guides or labels to indicate the contents of the cases and divisions. These are best made of tin or brass, sufficiently long to slide on and fit tightly to the shelves. The front portion, which alone is seen when the shelf is full of books, has a turned-over edge, into which printed cards containing the classification can be slipped. These are readily removable, and by their use the books can be closely classified upon the shelves.

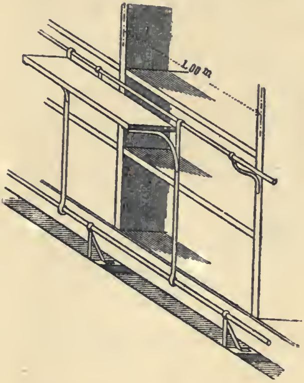


FIG. 24.—Table-shelf, from the National Library, Paris.

A handy contrivance is shown in Fig. 24, which is used in the Bibliothèque Nationale, Paris. It is a movable table-shelf, which can be fitted to any bookcase where required, and taken away again. In front of each case, at a height of about 3 feet 6 inches, is fixed a length of gaspipe, a similar length being also fixed about 6 inches from the ground and 4 inches from the case. An iron stay at each end of the table-shelf is provided with hooks, which fit on the bottom rod and over the top one, so forming a comparatively firm support. It is rather costly, as each bookcase must be permanently fitted with the two rows of gaspipe, and the bottom row, from its position, is liable to be bent and damaged by being trodden upon. A better adaptation of the principle would be to screw on each upright of all the bookcases, at a suitable height, a metal ferrule, and a similar one at the base of the upright. The top of the iron stays nearest the table-shelf should be bent at right angles to drop into the ferrules, and the bottom of the stays would similarly slide into the ferrules fixed to the uprights. If the table-shelf is not intended to support a great weight, a cheaper and better plan would be to screw beneath it a bracket of iron or of wood sufficiently deep to hold it at right angles to the bookcase, and merely hang it on to the metal ferrule by a straight hook. The convenience for many purposes of such a movable miniature table will be apparent to any one who has had to work in the narrow gangways of a book store.

In some towns branch lending libraries are open for a few hours only, generally in schoolrooms, on certain nights of the week. The system of folding bookcases designed by Mr. Charles Virgo for the Bradford central library seems well adapted for use in such cases. It is, of course, necessary to have the books under lock and key during the daytime, and this is generally done by providing an ordinary door to the bookcases. In Mr. Virgo's plan the inside of the door is itself shelved for books, and when shut is closed against the fixed portion of the bookcase, thus keeping the books secure from prying fingers and damage from dirt and dust. The bottom of each shelved door is provided with a castor, which runs along brass or iron quadrants screwed into the floor. A bolt is also provided which enters a socket in the floor, and holds the swinging-door securely open at right angles to the bookcase. The doors work right and left, and when open are back to back, forming miniature alcoves some 30 inches deep and 5 feet wide. It will be apparent that a great economy of space is thus obtained.

CHAPTER IV

INDICATORS, CARD-CATALOGUES, AND BULLETIN-BOARDS

THE use of indicators in public libraries is of comparatively modern growth. One of the earliest forms was that invented by Mr. F. Thornton Barrett, and used in the lending department of the Birmingham central library. It consisted of a wooden screen, on which printed numbers were pasted in horizontal columns of one hundred each. Opposite each number a small hole was drilled, and a plentiful supply of wire nails formed indicating material. The use of the contrivance was to save the time of the assistants, who before its adoption had to take the borrowers' lists to the shelves and look for the books required. The horizontal numbers on the indicator corresponded with the numbers of the books of fiction, and the lists were hunted through by their aid. When the assistant found a book number without a nail in its hole, he knew the book was on the shelf, obtained it, put a nail against the number to indicate it was out, and issued it to the reader. On the return of the books the operation was reversed, the numbers of the books to be replaced were called over, and the nails taken out of the corresponding holes. From this primitive contrivance, which was behind the counter and used only by the assistants, all the various forms of indicators, used either by the public or by the attendants only, have sprung.

Indicators may be divided into two kinds, namely, those which only show if the books are in or out, and those which combine with this a system of book-keeping and issue recording. One of the earliest of the latter kind is that invented by Mr. John Elliot, of the Wolverhampton Library (Fig. 25). It consists of a wooden frame, with a series of uprights at a distance of about 2 inches from each other. These are connected by shelves of tin, placed about $\frac{3}{8}$ of an inch apart. Numbers corresponding to the books are pasted to the uprights, one being placed opposite to each tin shelf. The method of work is simple. When a person joins the library he is given a reader's ticket, formed of thick millboard, folded like a book, with two or more pages of plain paper in it. This ticket is retained by the borrower when he has not got a book, and is kept by the librarian when a book is issued. If book No. 608 is wanted, for instance, the borrower looks for the number on the indicator, and if the shelf on the right of the number is empty, he knows that it is in, and asks for it at the issue desk. The attendant fetches the book from the shelf, stamps the date and the book number on the borrower's ticket, and then places it on the tin shelf in the indicator corresponding to the number. It remains there until the book is returned, and during that time shows by its presence to every one who looks at it, that

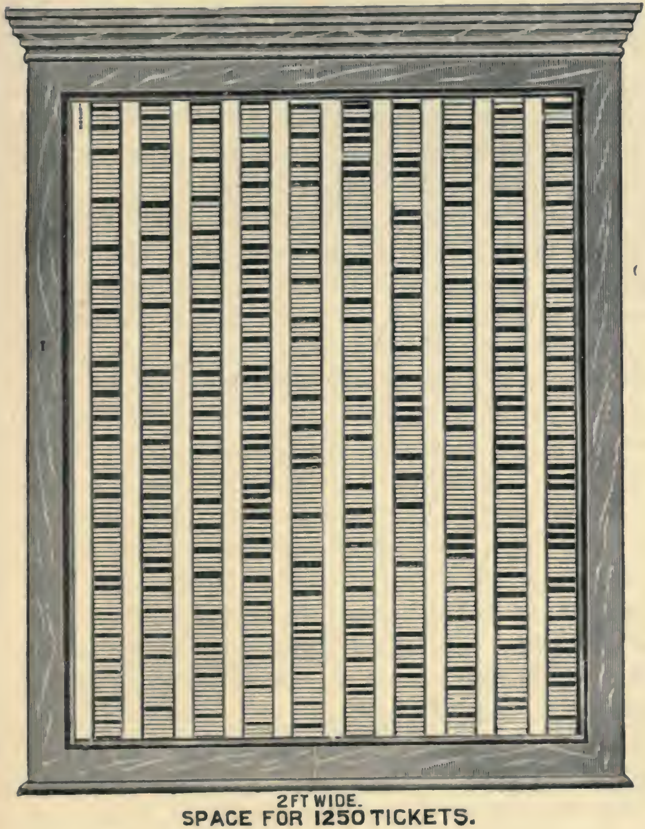

2 FT WIDE.
SPACE FOR 1250 TICKETS.

FIG. 25.—Elliot's library indicator.

the book is out, and therefore cannot be obtained. The ends of the readers' tickets are of different colours, and overdues are roughly indicated by them. The readers' tickets for books issued during any given period, say, a fortnight, have, for example, a red end to the front, and those issued during the next fortnight a black end. On the last day of the second fortnight a list is made of the books showing the red end, which will be all overdue, and in a fortnight's time a similar process is gone through for the black-edged tickets.

It will be noted in this description that the whole of the process of issue must be finished for each book as it is issued. The entries on the reader's ticket must be made at the moment of issue, and the ticket placed in the indicator to show to other readers that the book is not available. At busy times, in libraries where there is but a small staff, this causes some delay, and in the rush and hurry it may happen that a ticket is occasionally placed on the wrong tin shelf of the indicator, an error which causes much annoyance both to the reader who returns the book, and whose ticket cannot be found, and to other readers who may ask for the book which is out, but which by the displacement of the ticket is shown to be in.

The "Cotgreave" Indicator (Fig. 26) was invented some twenty years ago by Mr. A. Cotgreave, now of the West Ham libraries, and is that in use in the majority of the British free libraries. It consists of a metal frame with narrow wood uprights 1¼ inches apart, tin shelves connecting them at a distance of ⅜ of an inch from each other. On each shelf is placed a small metal case (Fig. 27), the upright ends of which carry a number in conspicuous white figures on a coloured ground. These are arranged in numerical order, one hundred in each column, and correspond to the numbers of the

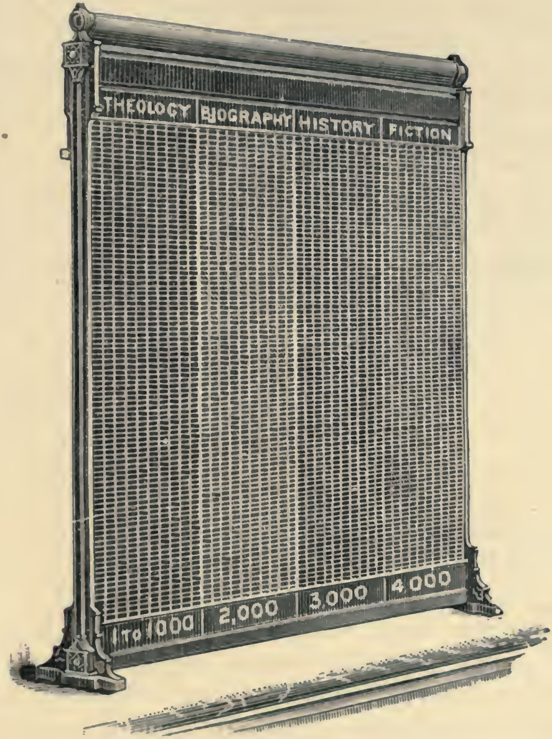
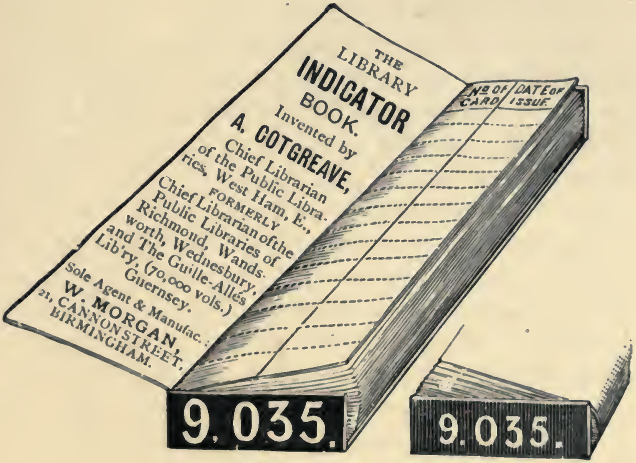


FIG. 26.—Cotgreave's library indicator.

books in the library. The white figures are on a blue ground at one end of the case and on a red ground at the other, one colour (say, blue) representing the books that are in, and the other (red) those that are out. Attached to each of the metal cases is a little ledger of ruled paper, the author and title of the book it represents being written generally on the first page.

Upon joining the library the reader is given a pasteboard ticket bearing his number, name, and address. This is narrow enough to pass into the metal indicator case, but it is a little longer, so that one end may project somewhat. The ticket is given to the borrower, and remains in his possession only when he has not got a book out. It is kept by the librarian when a book is issued to him, and retained until its return. The method of issue is for the borrower to examine the indicator and see if the book he requires is in. If the colour is blue, he hands in his ticket at the issue desk and asks for the book by its number. The attendant goes first to the indicator and takes out the metal slide ; he then obtains the book, stamps the date of issue in it, and gives it to the borrower. The number of the reader's ticket and date of issue is then written in the little book in the metal slide, and it is replaced in the indicator's frame, this time with the red end to the public, the reader's ticket being placed in it, with its end projecting slightly from the case on the librarian's side of the indicator. When the book is returned the operations are reversed. The attendant then receives the book and goes to the indicator, where he reverses the metal case to show that the book is now in and available for issue, returns the ticket to the reader, and the transaction is completed. The ends of the reader's tickets are coloured, or are cut to different shapes, and are allowed to project, in order that they may be readily



BLUE IN. RED OUT.

FIG. 27.—Cotgreave's indicator book.

seen by the librarian when looking for overdues. Different colours or shapes are employed to show the different periods of issue. Another and more exact method for doing so is by the use of tin slides, or caps of different colours, which are slipped over the upright portion of the metal case before it is returned to the indicator frame.

The details of the indicator work vary in different libraries. In some it is only used to indicate whether the books are out or in, and one of the many systems of card charging or book-keeping in vogue is worked with it. In the Lambeth libraries no entry is made in the metal slide at the time of issue, but it and the borrower's ticket are placed in one of the divisions of a tray made for the purpose, and the entry is made at leisure by a senior assistant. This is found to be a great help on busy nights, the whole attention of the staff being given to the actual issue, and the entering up can be left until the next morning.

The "Duplex" Indicator, in use at the Aberdeen library, consists of a frame with shelves, as in the "Elliot," but large enough to take a block of wood 4 inches by 2½ inches, and ⅜ of an inch in thickness. The block has pasted on one side a piece of ruled paper to receive a record of the issues. On one end is pasted the author and title of the book, as well as the shelf number; on the opposite end the shelf number only. The borrower upon joining the library is given a reader's ticket, and chooses a book from the indicator, those only being in of which the author's name, title, and number are visible. The attendant takes the block out of the indicator, obtains the book from the shelf, dates it, and gives it to the borrower. He then enters upon the wood block the number of the reader's ticket, and places block and ticket in a tray, which completes the process for the time being. The next morning (supposing that 500 books have been issued) the tray or trays contain 500 blocks from the indicator, with 500 readers' tickets sandwiched between them. The librarian takes the first pair, and sees that the number of the reader's ticket entered on the block is correct. He then enters in the reader's ticket the number of the block (or book) issued and the date, and places it in a numbered compartment of what is to all intents and purposes a second compressed indicator. He then picks up the block again, and under the number of the reader's ticket puts the date of issue and number of the compartment in which the reader's ticket has just been placed. The block is then returned to the public indicator and is replaced, but this time with the title edge turned towards the staff, to indicate that the book is out. On the return of the volume the assistant goes to the indicator, takes out the block, and reads the date and issue number of the last entry. Supposing it is the 201st of the 11th inst., he turns to the reader's ticket indicator frame for the 11th, and takes out the ticket from compartment 201, which he gives to the borrower, and replaces the wood block, this time with the title end to the public in the indicator, to show that the book is now obtainable.

The chief feature of this indicator is the register or indicator of readers' tickets. A separate frame is used for each day of issue, the date being shown by a movable slide at the top. Those for the last week of issue will be comparatively full of readers' tickets, those for earlier dates more empty. If the time allowed for reading is a fortnight, for example, the 13th frame back will contain the cards of all books one day overdue, the 14th of those two days overdue, and so on. The detection of overdues by this means is easy and certain, and a check can be kept upon the books liable to be fined. The counter space required is very large, and this no doubt has been the chief reason of its non-adoption by other libraries.

The indicators used for simply showing the public whether a book is in or not, depend upon some system of card charging or book-keeping for recording the issue. One of the earliest of these, which is still in use at the Birmingham central library, is the "Morgan" Indicator. It has lately been improved and superseded by the "Simplex," manufactured by the same maker, and shown in Fig. 28. It consists of a frame in which numbered diagonal shelves are placed, the numbers showing when the book is in, and are hidden when the book is out. The method of work is for the borrower, or assistant, to enter the number or name of the book required upon a coloured slip of paper. This is placed in the frame, and covers the number of the book from public view. Different coloured slips are used for different periods of time, and so the overdues are seen at a glance. The borrower's ticket may have coloured ends, and be placed over the number instead of the coloured issue slips.

The "Chivers'" Library Indicator, shown in Figs. 29 and 30, differs materially from the others described in this chapter. An indicator for a thousand numbers consists of four movable blocks, enclosed in a single column by a frame of oak or mahogany. The column measures 36 inches in height, and 9¾ inches in width. The blocks are made of wood, stained black on the public side, which is glazed, with gilt figures, and white on the librarian side, with black

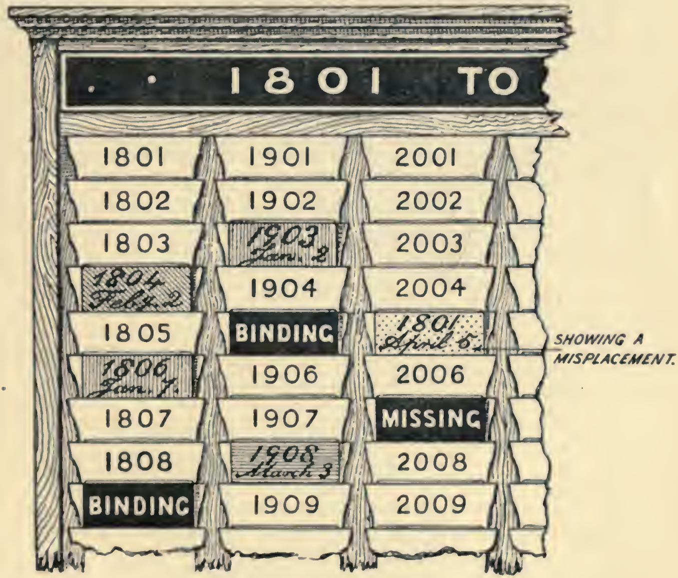


FIG. 28.—The Simplex indicator.

figures. The gold work is burnt on, in the same manner as on the backs of leather-backed books. The numbers are fixed in strict numerical sequence, and under each number is a little slot containing a narrow card or tab, which bears the same number,

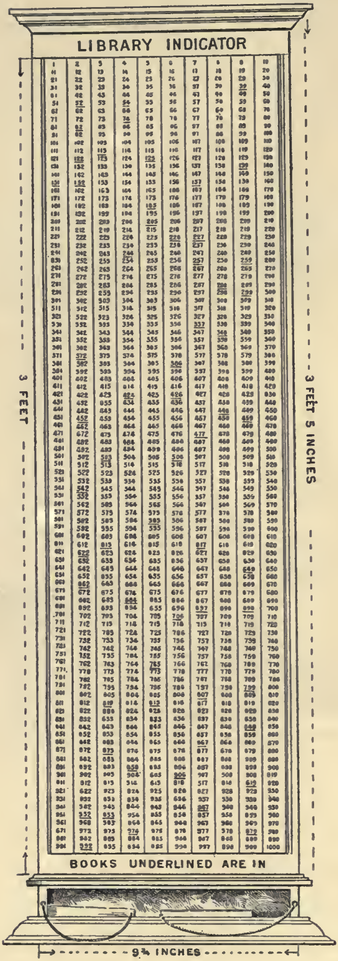


FIG. 29.—Chivers' indicator.

and represents a book in the library. The numbers are arranged in movable groups of 250, running in tens across the face, instead of in hundreds from top to bottom as in other indicators. This allows an economical arrangement of numbers in classified indicators, especially in small libraries, where it is an advantage to allot only a few numbers at a time to a particular class and allow it to expand, without at first purchasing a large number of separate frames. There is nothing, however, to prevent the indicator blocks being numbered in any manner preferred. Under each one-thousand indicator is a space intended to hold an indicator key or catalogue of the books, arranged in order of the indicator numbers.

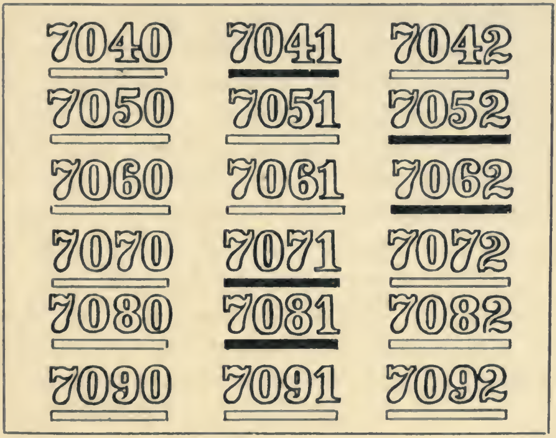


FIG. 30.—Chivers' indicator enlarged.

Books are shown "IN" by the presence of the little cards, which appear as white underlinings to the number above; when "OUT," the slots are blank. The records of issue are kept by a charging system, which may be adapted for various purposes, as individual choice and fancy may direct.

The indicator invented by Mr. Bonner of the Ealing Library has a similar frame to that of the "Cotgreave," but the columns are a little wider. Each of the tin shelves holds a pentagon-shaped block, on each side of which a number is printed on a different coloured ground. The books are indicated "IN" by one colour, say red, and "OUT" by any of the other colours. Only one side of the pentagon can be seen by the public, and the difference of colour shows how long the book has been out, and how soon it may be expected back. All books issued during the first week of the month have, for example, a black number to the front; those issued during the second week, a blue number; the third week, a green number; the fourth week, a yellow number. No record of issue is kept in the indicator. That is done by the ordinary day-book, but the borrower's cards, which are of thin millboard, are slipped into the indicator frame, over the pentagon representing the book borrowed. The counter space required for a block of one-thousand indicator is about 2 feet.

In planning the lending library, attention must be given to the amount of counter space required for the display of the indicators. The "Duplex" takes 32 inches for each thousand numbers; the

"Elliot," 36 inches, or in a compressed form, 24 inches for 1250; the "Cotgreave," 15 inches; the "Bonner," 20 inches; the "Morgan," 15 inches; the "Chivers," 10 inches; and the "Simplex," 11 inches. The system of issue to be adopted should be decided before the construction of the counter. If indicators are used, care must be taken to have the counter low enough to allow even children to easily read the top numbers. A height of 32 inches will be found the best for this purpose. The length, of course, must be determined by the number of indicators required, but two issue desks, each at least 3 feet in width, should be allowed for every 10,000 volumes. It should also be remembered that a good light is necessary upon each side of the indicator, so that it may be consulted with ease both by borrowers and staff.

In America the card-catalogue (Fig. 31) is universally adopted for use in libraries, but in Britain those using it at present are in a decided minority, although it is rapidly gaining ground as its advantages for certain departments of library work become known. It consists primarily of a series of drawers deep enough to hold a card about 5 inches by 3 inches, with a brass rod running from front to back of the drawer, upon which the cards are strung.

The books are catalogued upon the cards, one entry on each, and so are readily classified and arranged in the drawers in any order that may be wished for consultation by the readers. The great advantage is that by this means it is possible to keep the catalogue up to date, and always in proper order.

The drawers for the cards may be kept in a separate cabinet upon one of the tables, or be arranged in the counter near the issue desk. In the Guildhall Library, London, the cards are kept in a cabinet, while in the Lambeth and Battersea libraries they are placed in rows, two deep, in a counter. The card-catalogue cases at the University of Giessen have four revolving circular platforms. On these are placed the boxes which hold the cards. The reader can by revolving the platform

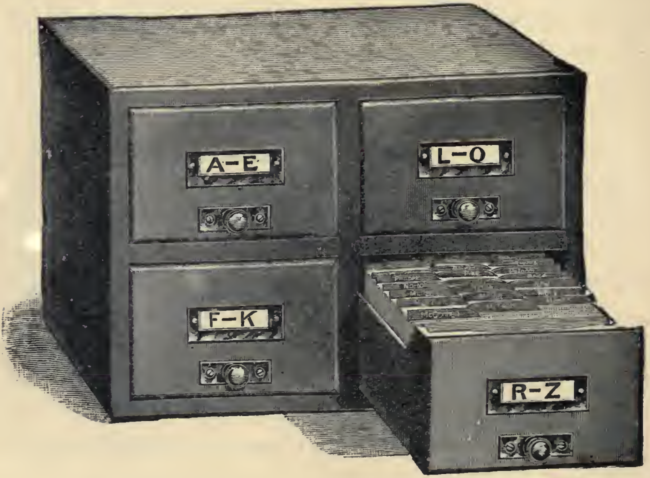


FIG. 31.—Card-catalogue cabinet.

obtain any box without it being necessary to alter his position. The boxes have movable ends, and the covers which, when closed, keep the end upright in box form, allow them to drop back to the proper angle for consultation upon being removed.

Whatever method is adopted for keeping the cards in order, care should be taken not to place them too high or too low for comfort in consulting them.

Where the card-catalogue is likely to be greatly used it is an advantage to have the drawers removable, so that they can be taken out and placed upon tables. They can thus be used by a larger number of readers than if massed together in a small case or cabinet. Much of the success of the card-catalogue depends on the quality of the appliances used. Too much attention cannot be bestowed upon obtaining material and appliances perfect in every detail. In a large catalogue, necessitating a cabinet with many drawers, the contents of each drawer should be marked on the outside, and by the use of guide cards at frequent intervals, as shown in Fig. 32, search is quick and easy. With these aids search for any name is always limited to about twenty cards, no matter what number of cards the catalogue consists of. The label on the outside of the drawer directs the reader to the drawer required, and the projecting guides within the drawer to the section wherein he will find the card he is looking for.

The principal uses to which card-catalogues are put in public libraries, are for catalogues of the additions to the lending and reference departments, and for indexes to the borrowers and their guarantors, &c. For these purposes they are always serviceable ; but they will not serve for the sole or general catalogue of a large library, on account of their cumbrousness and the space required for their accommodation when they run

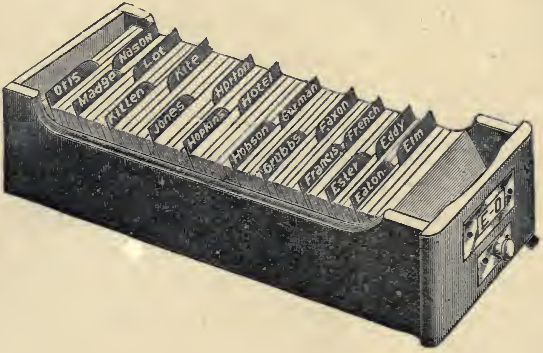


FIG. 32.—Card-catalogue drawer.

to any considerable length. In such cases the catalogue should always be printed in book form.

For use in a lending library, the card-catalogue will be best if fitted into small light trays which the readers can hold in the hand when consulting the indicator. For reference library purposes, drawers of heavier construction are better. Heavy drawers should run on slides strong enough to support their weight and prevent them sagging.

The trays and drawer cases illustrated in Figs. 31 and 32 are those of the Library Bureau. They are

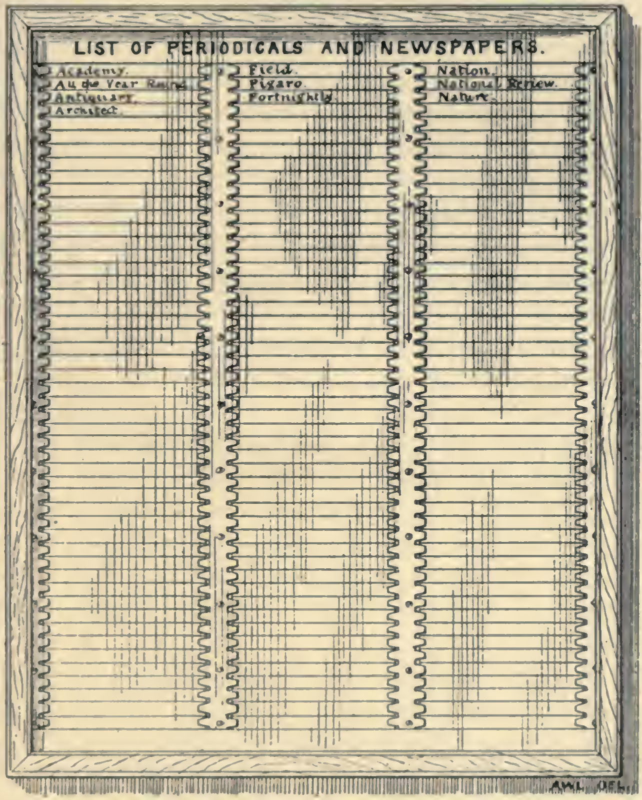


FIG. 33.—Lambert's magazine frame, with movable titles.

substantially built throughout of hard wood, and are as perfect in detail as experience can dictate.

Bulletin boards are necessary in all rooms for the display of notices, manuscript lists of recent additions, books of the hour, &c. They are best made in the shape of a shallow picture frame, with glass front to protect the notice from damage. In news-rooms they are useful to exhibit the large pictures and engravings issued with the illustrated papers, and which, from their size, cannot be kept in the reading-cases. A form of board formerly used at the Liverpool Public Library was useful for this purpose. It consisted of a series of strips of thin wood, each about six inches in length, which were placed between uprights, allowing them to be moved easily up and down. The titles of the recent additions were pasted one on each wooden slip, and inserted in its proper place, the whole list being thus kept in regular order. It took considerable wall-space, a square foot for about forty entries, and was for this reason abandoned. A good adaptation of the same idea is that shown in Fig. 33, which is a representation of Lambert's adjustable holder for lists of magazines and newspapers.

The protection of valuable plates from injury by handling is very important, but very difficult. It can perhaps be best effected by only allowing them to be examined through some transparent material, such as xylonite, a patent substance now coming into use for many purposes, as tough as gelatine, and as translucent as glass.

In very large libraries some rapid means of communication throughout the building is very important. The telephone has been introduced on a small scale into the British Museum, but is inadequate for the despatch of messages in writing, and consequently for the needs of the reading-room. A writing telegraph is required, and would probably be found in the *Telautograph*, an American invention which, for some reason, has not been properly brought before the public, but which has been tested with satisfactory results by the editor of this series. It consists of two machines connected together, a transmitter and a receiver; the message is written with a pencil in ordinary handwriting at the former, and appears simultaneously in facsimile at the latter. If transmitters were placed on the desks in the Museum reading-room, connected with receivers in the library, the ticket which the reader writes for his book would be conveyed to the proper quarter as fast as he wrote it, and all the delay incident to collecting the tickets in the reading-room and carrying them out would be saved.

Few adjuncts to a really first-class library, containing rare books and valuable manuscripts, could be more important than an efficient photographic department, where such treasures could be multiplied at a low charge for the public use. To their honour, the Delegates of the University Press have provided such an appendage to the Bodleian Library. A similar institution would be still more serviceable at the British Museum, but cannot be established without Government aid. Were this accorded, and the superintendence of a photographic department, both for the service of the public and of the Museum itself, entrusted to a salaried officer on the same footing as any other officer of the Museum, the cost of photographing books, MSS., and other objects in the collection, would sink to comparatively nothing; since the photographic staff being salaried by the State, no element of expenditure would remain except the cost of chemicals. At present the charges which the photographer is compelled to make for his own remuneration prohibit any extensive work of the kind from being undertaken, except by speculative publishers. If all the great libraries of the world possessed similar establishments, they might by mutual exchange assist each other with facsimiles of all manuscripts of national interest and of rare or unique books. The question was fully discussed by the Editor of this series in a paper read before the Library Association Congress at Dublin in 1884. Nothing has been done since, so slow is the march of improvement.

CHAPTER V

FITTINGS AND FURNITURE

IN considering fittings useful in libraries, attention will only be given to those that are either specially made for the work, or that are peculiarly adapted for the technical equipment of a library. It will be self-evident that the ordinary fittings of an office are requisite for a librarian who has much administrative work. A good roll-top, self-locking desk, with ample room, and sliding arm-rests, should be provided ; a copying press and stand ; a typewriter and table, suitable for card-catalogue writing ; a plentiful supply of cupboards for stationery and forms, should also be supplied. Money drawers and tills for fines and other receipts will be necessary in the lending department, and hat and coat hooks and umbrella stands for the use of the assistants should not be forgotten. If a proper cloak-room, with attendant, cannot be afforded for the public, a number of small umbrella stands must be provided, which should be placed at the ends of the reading slopes and tables. This will be found more satisfactory than a single large one near the doors, for the latter seem to increase the difficulty which some persons have of distinguishing between *meum* and *tuum*. In the reference reading-rooms hat pegs should be placed under the tables, or the chair seats may have double rails for that purpose. It will be found, however, that the general users of the newspaper and magazine rooms do not consider the removal of their hats to be at all necessary, and so plentiful provision need hardly be made for them.

In large libraries one of the most useful appliances is a book truck. Those in use at the

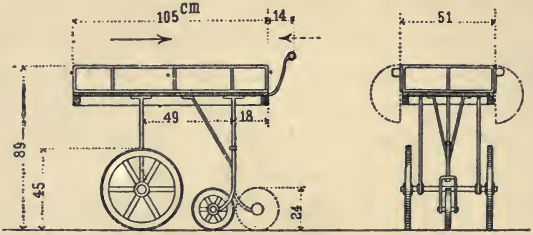


FIG. 34.—Book-truck in use at the University Library at Göttingen.

British Museum are 40 inches long, 40 inches high, and 14 inches in width. They have three shelves, which will each hold two rows of ordinary octavos, or about 220 volumes in all. The wheels are so placed that the truck can be turned in its own length, and as they have thick indiarubber tyres, a full load can be moved easily and noiselessly. The sides of the truck are covered with rubber to prevent injury to the furniture.

In Fig. 34 is shown a book truck used in the

University Library at Göttingen. This is a little wider than that in use at the British Museum, and has space for books only upon its top. The top has sides and ends to prevent the books slipping off, and the side pieces are hinged to fall back if it is wanted to carry large folios.

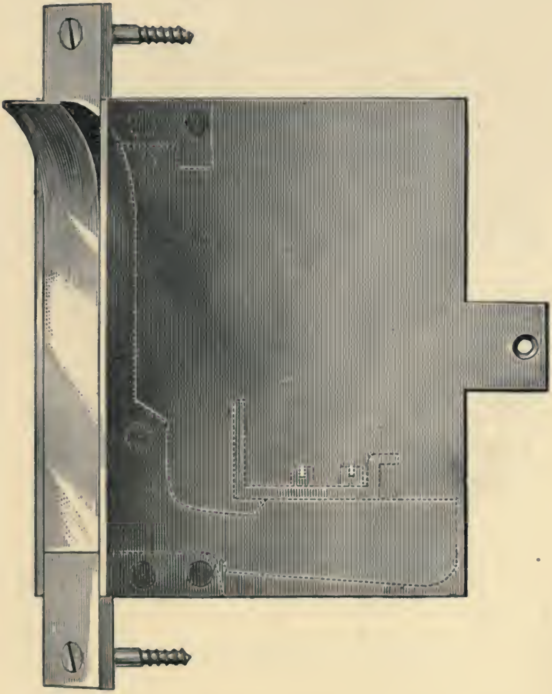


FIG. 35.—Cotgreave's automatic step, closed.

Different forms of the Cotgreave Automatic Step are shown in Figs. 35–37. It consists of a metal box or case, which can be fitted into the upright divisions of the bookcases. The step, when not in use, lies enclosed in the box, with the exception of a small projection at the top, just enough to enable it to be pushed down by the toe of the boot. Immediately the foot is removed the step swings back out of the way. If it is necessary to use one

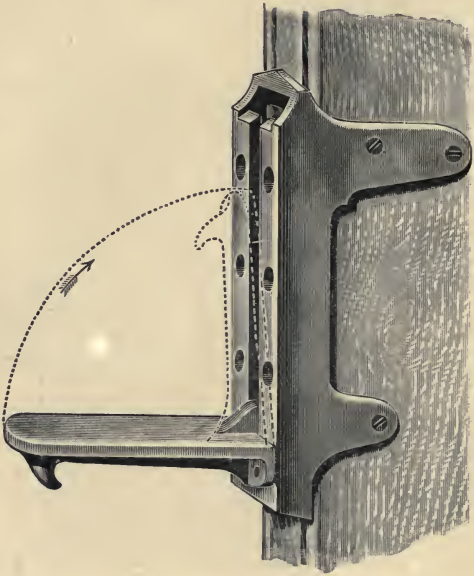


FIG. 36.—Cotgreave's No. 1 step.

particular step for any length of time a bolt is provided, by means of which it can be prevented from closing. Brass or iron handles should be screwed to each upright, at a suitable height for grasping. In cases where the upright divisions are slender, and will not allow the woodwork to be cut away for the insertion of the step, those illustrated in Figs. 36 and 37 will be found useful. They are screwed to the outsides of the uprights, and do not require any fitting. The step is removable, and may be raised

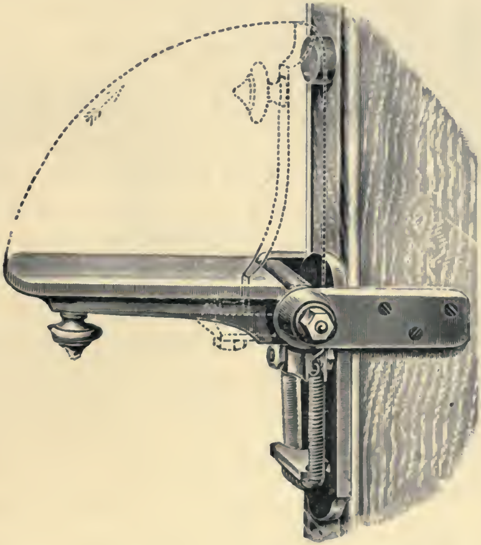


FIG. 37.—Cotgreave's No. 2 spring step.

from two to five inches if necessary. With these kinds of step an end pad of stout leather should be used, to prevent the binding of the books being damaged by the projecting iron work.

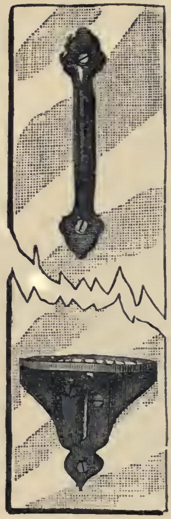


FIG. 38.—Library Bureau step and handle.

A cheap form of step and handle is that shown in Fig. 38. It is fixed by screws to the uprights, as high as may be needed. In narrow gangways it is an advantage to place the steps opposite each other, so that an attendant can stand upon them, and have his hands free without holding on to the bracket above. Besides the regular use for reaching books, steps of this kind are useful for reaching door and window bolts, gas jets, ventilators, &c.

Book supports of various kinds are in use for supporting the books in an upright position on half-filled shelves. The simplest, probably, is a rectangular piece of heavy wood, about 3 inches in thickness, and (if used for ordinary octavos) 8 inches in height. These may be cut diagonally across, so forming two supports out of one block. There are various forms of bent metal supports in the market. Different varieties are shown in Figs. 39 to 41.

The "Crocker" Book Brace is a plate of wood, with rounded edge and polished surface, a little smaller than the shelf upon which it is to be used. A fine spring of steel is attached by screws and nuts in a slot on one side, so that the length from end of spring to foot of brace is about half an inch more than the space between the shelves where it is to be used. The foot of the brace is placed against the books, with the spring outward. On raising it to a vertical position the tip of the spring is pushed along the under side of the shelf above, and so keeps it firmly in position. The end of the spring is slightly curved to facilitate its removal, and when a book is taken away, it is easily pushed forward; the accompanying illustration, Fig. 42, shows how it is worked.

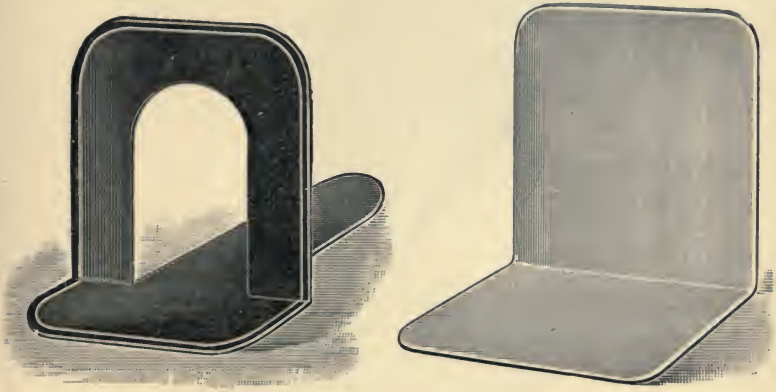


FIG. 39.—The Marlborough metal book supports.

The "Barrett" Book Support is made of bent wire. Fig. 43 shows its construction. It will be seen that it grips a shelf, and holds the books on the shelf underneath firmly and rigidly near the top, a point where a small force is much more effective than if applied at the bottom. It is easily adjusted, and is very cheap.

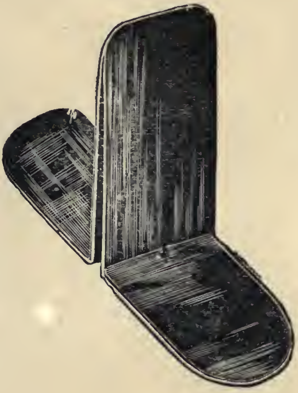


FIG. 40.—Mason's metal book support.

The Liverpool Public Library has a support for thick folio volumes which will not stand upright. It consists of a strip of iron, with flanges, screwed to the under side of the shelf above that on which the folios stand; on it another piece slides, and hangs downwards for about 9 inches. In use, the suspended portion is pushed along to the side

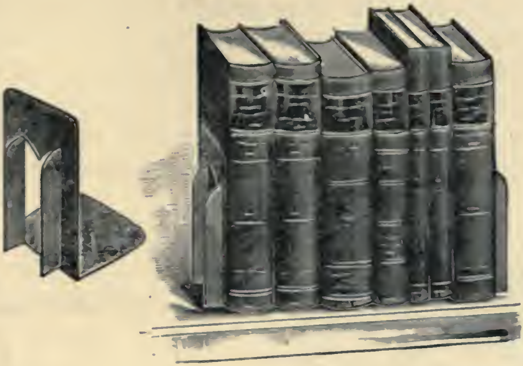


FIG. 41. -Library Bureau metal book support.

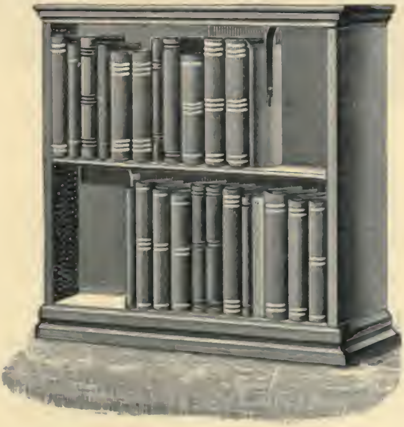


FIG. 42.—Crocker's book-brace and support.

of the last book on the shelf, and is secured there by a thumbscrew, which allows it to be tightened up or released as may be necessary. The support is fixed about the centre of the shelf, and holds the books near the top.

Fig. 44 is an illustration of one of the small book-lifts in use at the British Museum for carrying books up and down from one storey of the book-room to another. A paper with the title and press-mark of the work required is fastened to a clip, and so carried to the attendant on duty in that particular part of the building. He obtains the book, and places it in the wire cage shown in the illustration, which travels on an endless band around pulleys at top and bottom of the book-

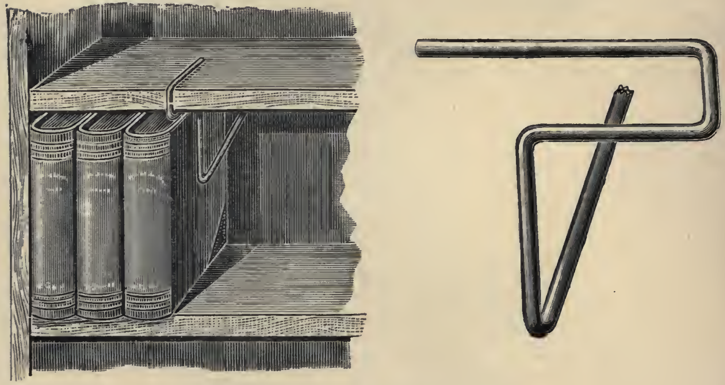


FIG. 43.—Barrett's wire book support.

room, and so reaches an attendant at the storey on the level of the reading-room floor. In the new building for the Library of Congress at Washington, a very extensive system of book lifts and book railways has been adopted. In that library it is necessary to send books out of the building to the Capitol, some hundreds of feet away. The books are ordered by telephone, and sent through a subway connecting the two places, through which endless bands, carrying holders at intervals, are continually travelling, as shown in Fig. 45. When the holder reaches its destination it turns over, and dumps the book carefully out upon a leather cushion in front of the attendant. In Chapter XI. will be found a description of the mechanical appliances in use in the new library building at Boston, Mass., for conveying books from the book stores to the delivery room.

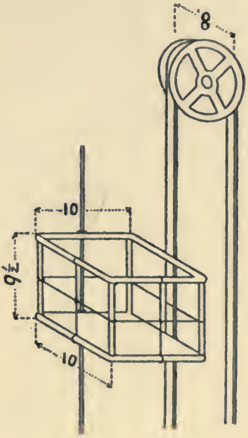


FIG. 44.—Book lift in use in the British Museum.

The ordinary tables used in the reading-rooms do not require much to be said about them. Care should be taken to have them a proper height from the floor, say 30 inches, and of size sufficient to give stability; they should not be fitted with castors, and if small, should be screwed to the floor. In some libraries it is the custom to seat the readers on one side of the table only, but in the majority they are seated on both sides. The latter is the most economical of space, as two persons can be seated to face each other at a table 36 inches in width, while a table to seat on one side only must be 24 inches wide at the least. The table space for each reader will vary. In news-rooms and magazine-rooms a space of 21

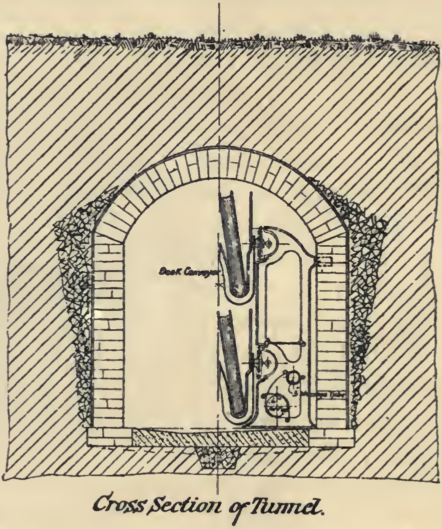


FIG. 45.—Cable book-carrier in use at the Library of Congress to convey books to the Capitol.

inches may be considered enough, but this should be considerably increased in the rooms used for study and in reference libraries. An ordinary chair is about 18 inches across, but arm-chairs will take a floor space of quite 24 inches, and a little room must be left for movement of the chairs. In the Mitchell Library at Glasgow, where it has been necessary to pack the readers in the smallest possible space, 196 persons are seated at 14 tables in a room 68 feet by 38, an allowance of less than 13 square feet of floor space for each reader, as part of the room is taken up with use of catalogue counter, &c. To allow of proper freedom in movement, at least 16 square feet floor space should be given to each reader in a magazine- or news-room, and 20 in the reading-room of the reference library.

Flat topped tables are generally used for newspapers and magazines, but some should be provided in the reference library with sloping tops for the accommodation of the larger books. These should have a slight ledge at the bottom edge to prevent books and papers from sliding on to the floor. In libraries where there are valuable books, the table tops should be padded to prevent injury to the bindings. In the Newcastle-upon-Tyne reference library they are covered with billiard-table cloth, in the British Museum with cowhide. A few of the tables in the reference reading-room should be fitted with slides for use when several books are consulted.

The British Museum provides an elaborate desk for its readers, which is worth detailed consideration. Fig. 46 shows the desk as allotted to each reader. It is 50 inches in length, the table portion is 28 inches in height and 24 inches in breadth, and the middle division separating it from the opposite reader is 22 inches high and 6½ thick. In the centre of the upright is an inkwell, penwiper, and place for penholders and pencils. In Fig. 47 the central portion of the desk is shown on an enlarged scale. The parts marked A in Fig. 46 open outwards; the right hand side is hinged at the bottom, and falls down, forming a shelf 17 inches by 11 inches. On the left hand side a movable shelf for holding an open volume is hung, as shown in Fig. 47.

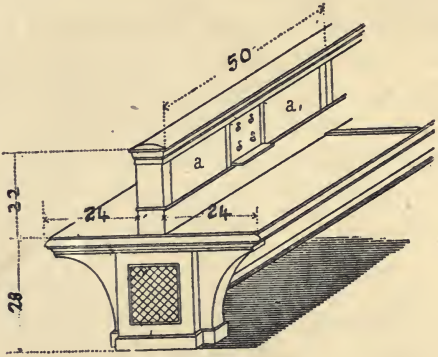


FIG. 46.—Desk for readers, from the British Museum.

The front easel part is hinged at C., and is 16 inches square. It has at the bottom edge a folding ledge, E, for holding a book up. On the top edge, in the centre and at the left hand corner, are two hinges, and a brass rack and pinion arrangement, H, reached through an opening in the easel, allows

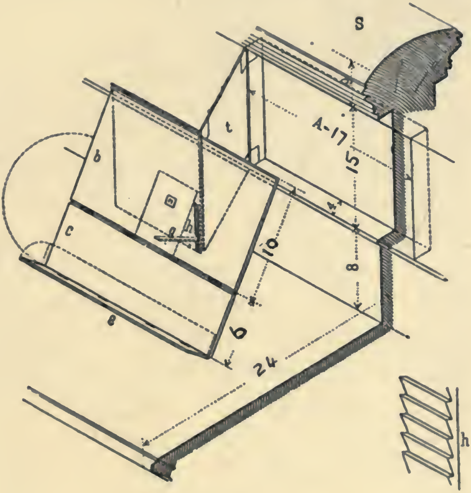


FIG. 47.—Central movable portion of the British Museum desk for readers.

of adjustment to any angle. When not in use the whole folds up, and fits into a recess 2 inches in depth. On either side of the reader, underneath the desk, are wooden pegs for hats. The whole of the desk and folding shelf arrangements are covered with padded leather to prevent injury being done to the bindings of the books.

In addition to the desks just described, a row of flat tables with padded leather tops is placed between each row of desks for the easy consultation of large folios.

The magazine rack, shown in Fig. 48, is so arranged that each shelf is at a different angle, and a man of ordinary stature standing in front of it can see the whole of the papers placed thereon without stooping. The shelves are covered with a movable glass slide, so that the name of the magazine, or an old cover, may be placed underneath to indicate where the paper should be replaced. The newspaper racks invented by Mr. A. Cotgreave are of different construction. In one the papers are placed behind each other, and are attached by clips to the shelves. The papers hang down behind the shelves, and only expose the upper portion to view containing the name: great economy of space thus ensues, and 100 different periodicals of quarto size can be exhibited in a rack 5 feet 6 inches in width.

Cotgreave's improved rack, shown in Fig. 49, is made in the form of a wall case, with shelves at intervals, and brass rods fitted across each division to hold the papers in a vertical position. The St. Giles' library has a smaller rack on the same principle, Fig. 50, placed along the centre of the tables, for the reception of the magazines. Another table rack, shown in Fig. 51, is triangular in form, and has a ledge at the bottom to prevent the papers slipping down. In the Mitchell Library, Glasgow, one is used consisting of a flat shelf screwed on brackets

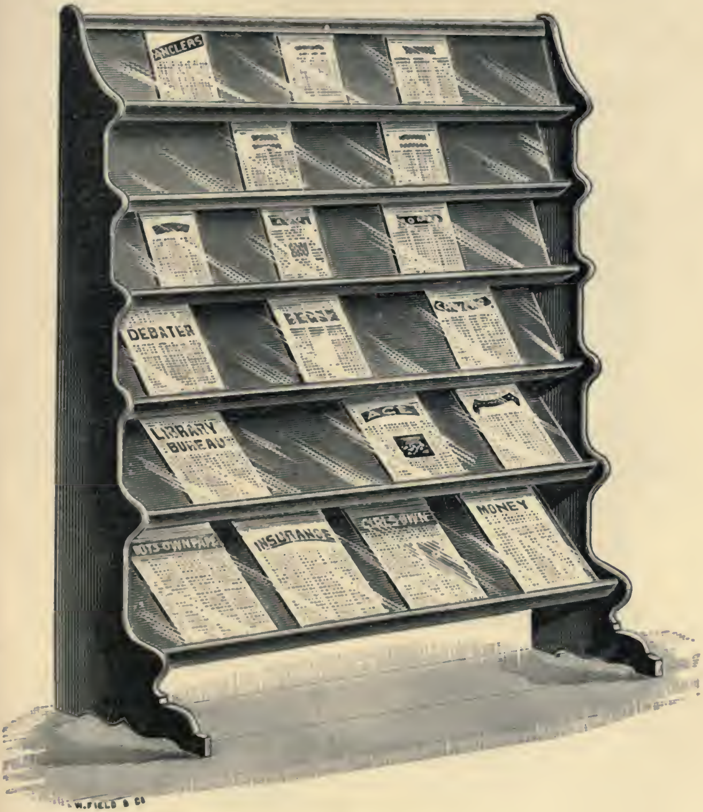


FIG. 48.—Library Bureau magazine rack.

to each table at a height of about a foot. The magazines are placed flat on the shelf, and so do not interfere with the use of the table underneath.

An excellent newspaper file is that shown in

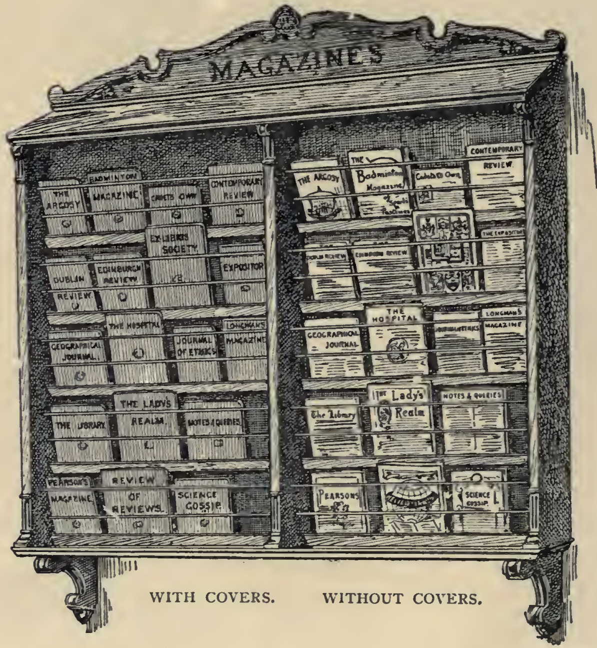

MAGAZINES
WITH COVERS.
WITHOUT COVERS.

FIG. 49.—Cotgreave's improved wall rack for magazines.

Figs. 52 and 53, and called the Bowry File. It consists of two strips of stout ash, in one of which is inserted two lengths of thin spring steel, about ¼ inch in width, with pointed ends. The newspaper is pierced by the steels, and the second piece of ash, which has two corresponding holes, is placed over the springs. A couple of brass runners are squeezed along over them, and clamp them down, keeping the ash strips with the enclosed papers tightly together. Another form of file is the "Atwater"; it consists of two strong sticks, held together by strong rubber rings at each end. The "Athenæum" File consists of a centre stick, around which are arranged seven smaller sticks, kept in place by the handle at the bottom and an indiarubber ring at the top. Each of the smaller sticks binds the middle of each paper against the others, and holds it securely. Both of these files are useful for keeping a small number of papers together.

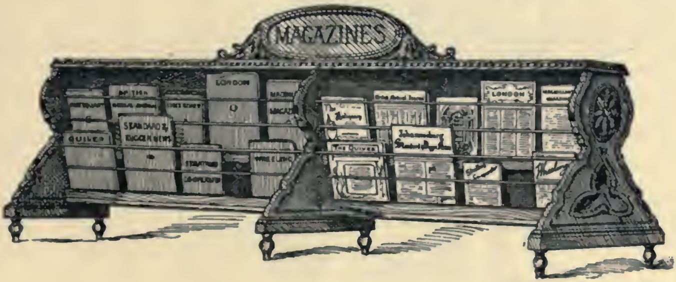


FIG. 50.—Cotgreave's table-rack for magazines.

A form of newspaper file which is useful in

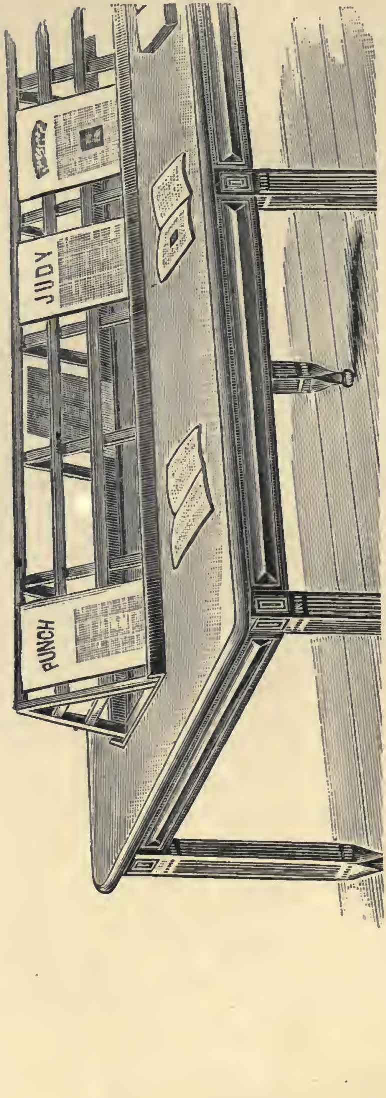


FIG. 51.—Library Bureau table-rack for magazines.

news-rooms for holding back numbers of newspapers is the "Banbury," shown in Fig. 54. It is made in polished wood, with nickel-plated metal-work. The spring arm, when pulled down, stands out at

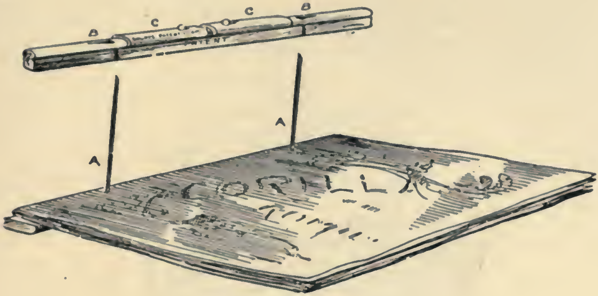


FIG. 52.—The Bowry newspaper file open.

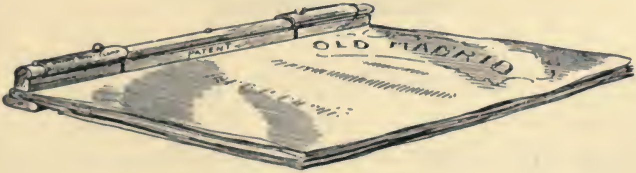


FIG. 53.—The Bowry file closed.

right angles, and forms a support for the papers, leaving them free to be turned over until the one required is found. The wire-work may be obtained separately, and a series of them can then be screwed to a suitable upright.

A comfortable chair should be provided for the reference reading-room. One without arms is to be preferred for use in the news-rooms. In some libraries, where space has to be greatly economised, chairs are furnished with revolving tops, and are screwed to the floors. This allows a narrower passage between the tables than can be obtained if the chairs are movable. A word of caution may be given against the use of benches or forms in news-rooms. They are unsightly in appearance, and a great nuisance to those who have to use them. Several attempts have been made to render the movements of the chairs noiseless. In rooms whose floors are covered with thick cork carpet the noise is not noticed to any great extent; but in large reading-rooms, where the boarded floors are bare, the constant movement is a nuisance. Rubber

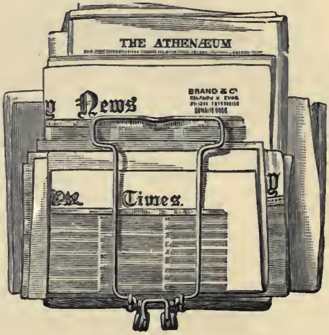


FIG. 54.—The Banbury newspaper file and holder.

thimbles to fit over the chair legs, and plugs of rubber fastened into holes, have been tried, but they are soon dragged off in rooms where there is much traffic. The most satisfactory form seems to be a round rubber or leather pad the same diameter as the chair leg, screwed into it, but the screw hole must be countersunk, so that the head of the screw shall not project and scrape the floor.

One of the most useful appliances in a library is the "Walker" adjustable book and card rack, shown in Fig. 55. The wire partitions are movable, and can be adjusted to any space. It is useful for sorting catalogue slips, as with it they can be kept in an upright position, and do not require to be spread out over a large surface. The physical fatigue thus saved will be apparent to any one who has had much experience of alphabetising catalogue slips and cards. The rack is suitable also for holding the cataloguer's books of reference upright on the table in front of him, and so keeping them close to hand. Sorting trays are also a great convenience to the card cataloguer, as they save a great deal of

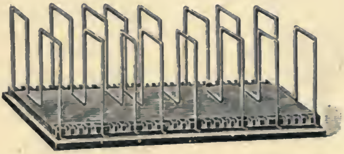


FIG. 55.—Walker's book-rack and slip-sorter.

labour and trouble. They are made of tin or wood, divided into five compartments. Five trays, provided with a set of printed guide cards, A–Z, should be included among every cataloguer's tools.

In libraries where the books have to be shelved above seven feet high, ladders are a necessity. Of these there are several forms. If an ordinary ladder is used, it should have a cross-piece at the top long enough to reach from one upright of a bookcase to another, so that when in use it will rest against two uprights and not against the books. The cross-piece should be padded to prevent any damage. In narrow gangways a long cross-piece is apt to be in the way; and at the Royal Library, Brussels, a ladder is used which has hinged to its top two vertical cross-pieces, hanging downwards, and which rest against the fronts of two or more of the shelves. Fig. 56 gives an illustration of this ladder and its method of construction.

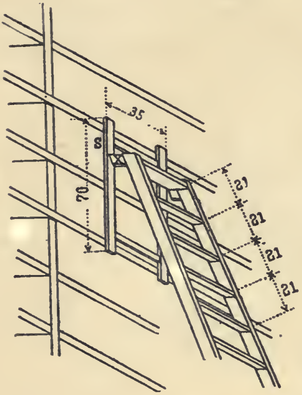


FIG. 56.—Ladder with movable head, from the Royal Library, Brussels.

In the Newcastle-upon-Tyne public libraries a brass rod is fixed across the front of the bookcases at a height of about ten feet from the floor. The ladders have hooks at the end of each side-bar, and a second pair at a distance of about three feet from the end. When in use the ladder rests upon the fixed bar, and is held firm by the top hooks, and when not in use it is hung up on the bar by the lower hooks, and rests against the bookcase.

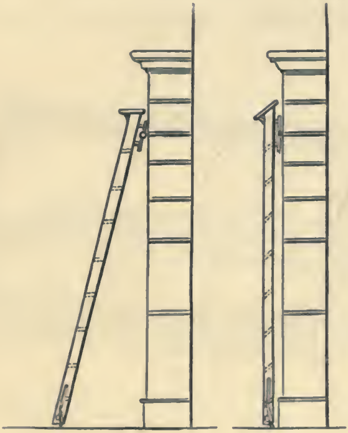


FIG. 57.—The Victor ladder.

An American adaptation of this principle is seen in the "Victor" library ladder, of which an illustration is given in Fig. 57. The ladder runs upon a brass or hard wood rod screwed to the face of the bookcase at a suitable height. The rod is gripped between the grooved edges of two small wheels on each side of the ladder, and also has wheels at the foot upon the floor. When not in use it can be pushed close up to the shelving, and can be brought out readily, while it stands at any desired angle.

It will be advisable to have a few ledger rests or easels for use with the larger books. Fig. 58 illustrates the kind in use at the Newcastle-on-Tyne Library, and Fig. 59 a table used for the same purpose from the University Library at Göttingen. The table-rest shown in Fig. 60 is very useful for holding a book open at a given place for a length of time, as is frequently wanted when copying illustrations, manuscripts, illuminations, &c.

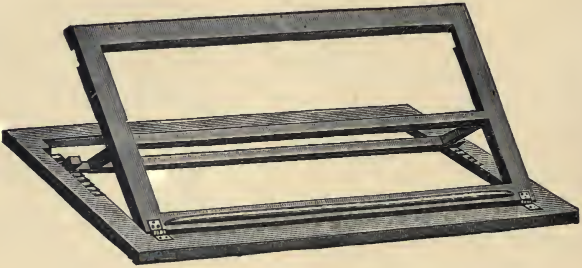


FIG. 58.—Easel for folios, from the Newcastle-upon-Tyne Library.

Reading-stands for the display of newspapers are used in all public reading-rooms. The shape and principles of construction are well known, but the design and ornamentation give ample scope for originality. The most useful size is a double stand, 8 feet 6 inches in length; this gives ample space for two of the largest morning papers, or three of smaller size, on each side. A good arrangement which prevents overcrowding is to place an evening paper next to a morning paper, or to insert one of the local weekly papers between each of the daily.

Care should be taken to have the slope at a proper angle, for if it is too steep the papers droop, and if too great the upper portions are unreadable by many; an angle of sixty degrees will be found reasonable. The height of the stand should also receive attention. A good medium height is 3 feet to the bottom of the slope, and 5 feet 6 inches to the top. No fixed height will be correct for persons of both tall and short stature; and in Lambeth, where the stands are 37 inches to the bottom of the slope, a platform or step, 7 inches in height and 9 inches broad, has been screwed to the floor in front of each stand. There should be a slight

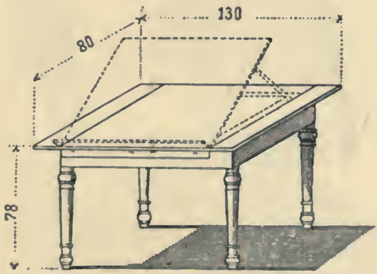


FIG. 59.—Table-easel for folios, from the University Library, Göttingen.

ledge on the bottom of the slope, and a brass rail running the length of the stand, secured by brackets to the slope, will be found useful in preventing readers from leaning on the papers and tearing them. The names of the papers should in all cases be affixed in bold type to the top of the stand for easy identification. They are best seen if painted black on movable slips of opal glass.

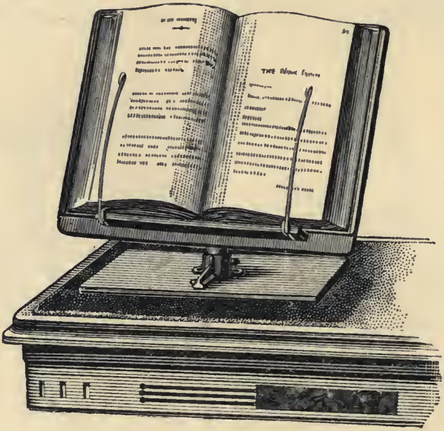


FIG. 60.—Table-easel for copying.

There are many methods of fixing the papers to the stands, but in all cases where papers of a single sheet are exhibited it will be found best to glue to the slope under the fastening rod a thin strip of indiarubber. This gives a grip, and keeps them firmly in position.

The "Heathcote" revolving newspaper-holder is very useful in libraries where the illustrated papers and periodicals are placed upon reading stands. It consists of a strip of wood, as shown in Fig. 61, revolving on a pivot in the centre. Near either end a small indiarubber wheel is provided, which prevents any defacement of the slope when the holder is turned around. A brass rod, hinged at the bottom and locked at the top, holds the paper securely. It is provided with adjustable brass prongs for holding the pages flat. When fixed to the slope the holder can be turned in

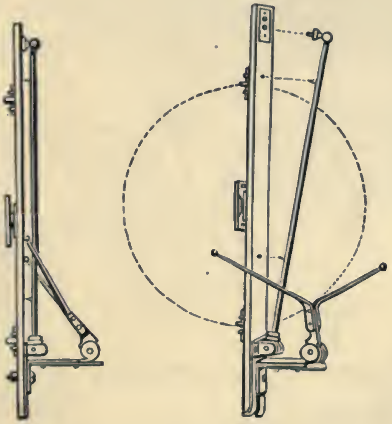


FIG. 61.—The Heathcote revolving illustrated newspaper-holder.

any direction, and thus allows a full view of all the side illustrations, which cannot be properly seen if held by the ordinary newspaper fastener.

The "Lambert" clips, shown in Fig. 62, are also useful for illustrated papers with double page engravings. They consist of two short pieces of brass, fastened at the top and bottom of the slope. The paper is inserted at either end, and one turn of a screw fastens it securely down, no portion of the

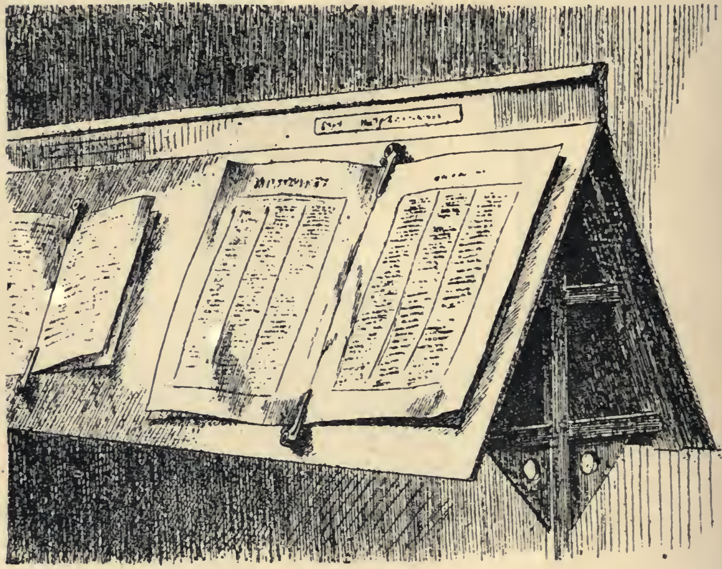


FIG. 62.—Lambert's newspaper clip.

printed matter being hidden by the fastening. For ordinary newspapers without illustrations there are many forms of fasteners. The "Cummings" is a somewhat expensive contrivance of gun-metal, which is fastened by a key or a revolving eccentric nut. The "Chivers," shown in Fig. 63, is a steel rod, hinged at one end, and fastened with a lock at the other, which drops into a groove in a strip of wood. It is readily movable without disfiguring the slopes. The North of England School Furnishing Co. have fitted several libraries with the "Burgoyne" fastener. This is a thin brass rod hinged at top, and snapping into a lock at the bottom. A second form of fastener is a rod which has a screw attached to the bottom end, falling through a hole in the slope. It is tightened up by means of a thumbscrew underneath.

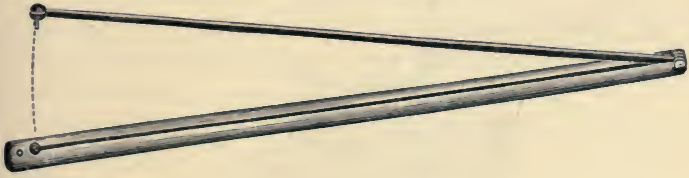


FIG. 63.—Chivers' newspaper-holder.

Harvey's Pneumatic Dusting-Machine is a most useful appliance for large libraries. By means of this novel contrivance loose dust is drawn off from any surface by air suction and conveyed direct into a dust-tight receptacle within the machine, from whence it can readily be removed. Fig. 64 shows the working parts of the machine. E is a lever which works the bellows, resulting in a continuous indraught, or suction of air, at the nozzle A. When the machine is in use a flexible tube is fitted into the socket at A, and a cleaner or brush is fitted at the opposite end of the tube. The cleaners are of various shapes, depending upon the

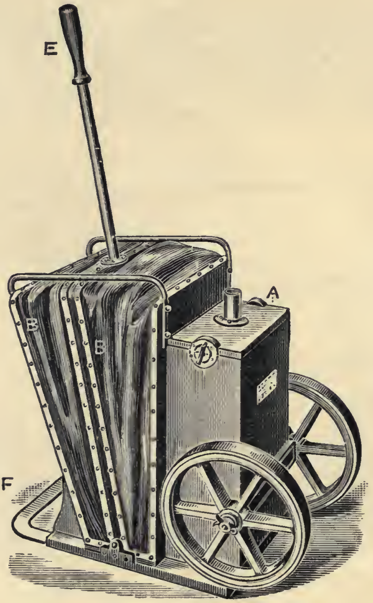


FIG. 64.—The Harvey dusting-machine.

purposes for which it is to be used, whether flat, like table tops or shelves, or irregular, as for the tops of books. The action of the cleaner is as follows: the air, as it is drawn through by the action of the bellows, is concentrated into a small compass, and so produces a very powerful current, which, being directed sufficiently close to the dust, instantly carries it away into the dust-bag. The latter is placed immediately under the lid A, and is made of porous calico, which arrests the dust, but allows the air to pass through and escape at the exit. The machine is in use at several of the larger libraries for dusting books without removing them from the room, and has received great praise from those who have used it. It cannot be too strongly impressed upon librarians that no system of dusting can be adequate that does not insure the absolute exportation of dust from the premises, instead of its mere removal from the books to be deposited upon surrounding objects.

CHAPTER VI

THE ARCHITECTURAL HISTORY OF THE BRITISH MUSEUM LIBRARY

THE history of all library architecture is pregnant with two especial morals—the need of building from the first upon some well-considered plan, so prepared as to admit of harmonious development in the future, and the necessity of making extremely generous estimates in respect of space. Unless in the case of libraries devoted to special classes of books, or of branch libraries controlled from the parent institution, or of libraries where books no longer in general demand are systematically sold off, space, unless the most effectual measures have been taken at the very outset, must eventually become the librarian's master. The architectural history of the British Museum is to a considerable extent a history of struggle against circumstances created by neglect of these elementary principles.

When the Museum was established in 1753 by the posthumous munificence of Sir Hans Sloane, the same question presented itself to the Government as that now agitated in connection with the still more munificent bequest of Lady Wallace, Was it better to build a new repository, or to acquire a repository already built? It is not likely that the scientific side of the question attracted much attention in those days. Little thought or care had been bestowed upon the construction of museums, by reason of the lamentable paucity of such institutions. It was enough for the most scientific if room could be had and something to spare, and the prodigious development of the establishment was utterly unforeseen. Instead, therefore, of erecting an edifice on a consistent plan, with provision for due enlargement, the Government bought a mansion which happened to be vacant, splendid indeed, and commodious for the purpose it had been intended to answer, but erected without the remotest idea that it could ever serve for a museum. It certainly does appear to have fulfilled this end longer and better than could have been anticipated. It was, in truth, a palace, and the work of no mean builder; for the plan was formed by Robert Hooke, the first natural philosopher of his age after Newton. Built in 1674, burned down in 1686, it was re-erected by a French architect, Pierre Puget. A French traveller who visited England in 1818, in a state of great soreness by reason of the battle of Waterloo, speaks with contempt of the Museum collections of that day, but tells us that he highly admired the edifice, and could not refrain from inquiring who had built it. On being informed that the architect was a Frenchman, "Thought so!" he exclaimed, rubbing his hands, and records the incident in blissful ignorance of the fact that Puget had built on Hooke's lines and merely reproduced the design of his predecessor. No doubt, however, Hooke had taken many hints from France, where, in the then palmy days of Louis XIV., architecture flourished much more than in England.

Buckingham House had been offered as an alternative site to Montague House, with surrounding fields which would have allowed room for extension; but it would have cost £30,000, while Montague House could be had for £10,000; it was also, and not unnaturally at a period when the Prime Minister lived in Lincoln's Inn Fields, considered a more out-of-the-way situation than Bloomsbury. Before censuring the Government for parsimony, it should be recollected that £12,800 were paid for the repairs of the house, which had been estimated at £3,800. The noble proprietor, Lord Halifax, must have been glad to escape from this heavy obligation, and as he was a friend of the Duke of Newcastle's, private influence may have had something to do with the selection of his mansion as the national repository.

However this may have been, Montague House—a really magnificent structure, with pictorial decorations of great merit—was probably quite as well suited as any other private mansion to house its miscellaneous stores of books, manuscripts, coins, stuffed animals, shells, fossils, and reptiles in spirits. As the books were removed to the new building in 1838–39, not many now living can remember the appearance of the library when within its walls. Many more will remember the appearance of the rooms at Marlborough House during the temporary location there of the Vernon Gallery, and probably the general appearance was much the same. In both cases elegant rooms *en suite* were applied to purposes for which they had never been intended; the pictures could not be well seen, and the books can only have been accommodated at a sacrifice of the space and convenience which they might have enjoyed in chambers constructed under other conditions. It must be acknowledged that no great multitude either of books or of readers was contemplated, the accommodation provided in the reading-room on the basement, described as a very comfortable room, being for only twenty readers, the actual daily attendance rarely exceeding ten or twelve. It would be interesting to learn in what proportion and under what principles the allotment of space was made, whether the several departments were satisfied, and whether frequent readjustment was found necessary. The materials for such research probably exist among the mass of Museum official papers, which must some day be made public in the form of a calendar, which will be pronounced one of the most valuable contributions ever made to the history of literature, science, and archæology.

For long after the establishment of the library in Montague House the annual additions to it were so limited that a fair idea of its original extent may be derived from the first catalogue of its contents, published in 1787 in two volumes folio. It is true that thirty thousand Civil War tracts had been presented by George the Third, but these are compendiously entered in the said catalogue under a single title, headed *Anglia*. They claimed considerable space, and so did the valuable benefaction of the Garrick plays; but on the whole, if there was room to spare for the library at the beginning of the century, there probably was also at the end. Early in the new century, however, a great engine of extension came into operation. The enforcement of the Copyright Act, passed in Anne's reign, and extended in 1774, had been neglected both by the Museum and the Universities. In 1805 Mr. Basil Montagu, the distinguished biographer of Bacon, at that time a resident at Cambridge, finding that he could not obtain the books he required for his studies otherwise than by purchase, moved the University authorities to put the Act into effect. They did so; the Museum authorities were obliged to follow suit; the publishers protested, and the controversy resulted in the enactment of a new Copyright Act in 1814, which endured until 1842. Although the Museum authorities had scarcely risen to the conception of the national library as a universal repertory of the national literature, they were by no means averse to obtain gratuitously books which they esteemed valuable; and it appears from a contemporary article in the *Quarterly* that their proceedings were considered, by Mr. Murray at all events, to savour of undue harshness. The resulting accumulation of books pressed upon the resources of Montague House, which had already given way in another department—the archæological collections. These, scarcely existing at the foundation of the Museum, had assumed large proportions by the Townley bequest and the captures of Egyptian antiquities made from the French. The charming garden, with the fine trees, still surviving in the contemporary plates which show the military encamped in it on occasion of the Gordon Riots, had already been sacrificed to those antiquities, which claimed a further extension when, in 1817, after a tremendous fight with economists, connoisseurs, and moralists, the Elgin Marbles were acquired for the nation. The internal accommodation they got may be seen in a most interesting picture preserved in the Trustees' Board Room ; it was not worthy of them. It is due, however, to the administration of that day to point out that this was regarded as a mere temporary shift, and gave place about the year 1821 to a comprehensive scheme of rebuilding, of which Sir Robert Smirke was no doubt the author, and which, the new reading-room and its annexes excepted, has determined the general character of the edifice to this day. Nor was it unworthy of a great nation and a distinguished architect. Our concern with it, however, is merely as regards the library. This department, probably very unexpectedly, came to be the first to exemplify the new scheme, in consequence of the donation of the King's Library in 1823. Room must be found for the books, and accordingly nearly one entire side of the quadrangle projected by the architect was devoted to the magnificent King's Library, a hall probably without peer in the world as the receptacle of a single collection of books. Superb, it was in no way utilitarian; space was lavished for effect in a manner to horrify a modern librarian anxious before all things to make the most of every inch of ground. But for the happy invention of the sliding press it would ere this have been necessary to adapt it to the reception of more books, even to the ruin of its architectural effect. Ere the movable press had dawned upon him the editor of this series had proposed to introduce the Grenville and Cracherode Libraries into it by carrying out presses from the wall, a step which if on architectural grounds at best a sad necessity, would at all events have displayed the noblest assemblage of books given to the nation that the world ever saw. It may now be hoped that no such step will ever be necessary.

The King's Library, though claiming so large a portion of the available Museum space, provided only for the additional books which it was especially constructed to receive. The need of provision for the annual accessions remained as great as ever; but years elapsed before it could be met. At length, besides the handsome manuscript rooms at the south end of the King's Library, the North Library was constructed, comprising the really magnificent Great or Large room, the Banksian and Cracherode Libraries, the two supplementary rooms, and the two new reading-rooms. In such of these rooms as were sufficiently spacious, the reading-rooms of course excepted, great additional space was gained by carrying out presses at right angles with the wall, otherwise they did not materially

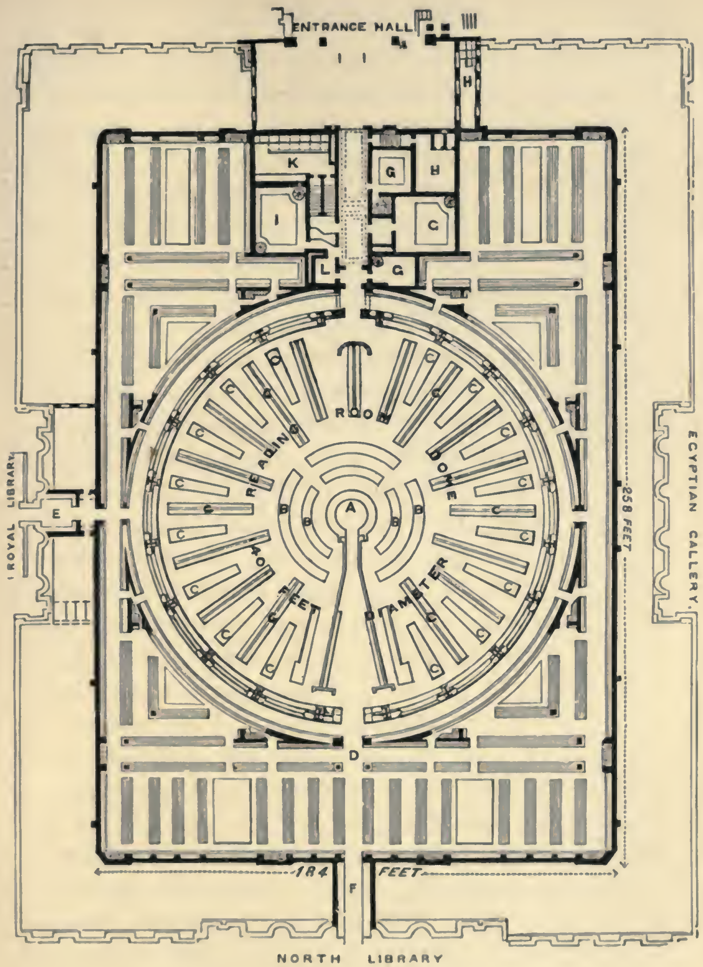


FIG. 65.—Plan of Reading-room, British Museum.

A. Superintendent's desk.
B. Catalogue tables.
C. Readers' tables and desks.
D. Access for attendants.
E. Entrance from Royal Library.
F. Entrance from North Library.
G. For registration of copyrights.
H. Ladies' cloak-room.
I. Gentlemen's cloak-room.
K. For gentlemen.
L. Umbrella room.

differ from libraries of the accepted type, of which they were favourable examples. One great defect —the absence of glazed cases for the preservation of valuable books—was subsequently supplied by Sir Anthony Panizzi. The rooms were ready for occupation in 1838, and the removal of the books from the old apartments of Montague House was carried out under Panizzi's directions, with a speed and smoothness which astonished every one. A minor but most valuable improvement was made in the alteration of the barbarous old press marks by affixing Arabic numbers to the new presses, as already done by his predecessor, Mr. Baber, in the King's Library. The labelling of the books followed, due to a suggestion from Mr. Winter Jones. While this removal was in progress another library was beginning to rise, which really did present novel features, and which, had it been possible to have made it four times as long, would have been the most imposing library in the Museum, except the great Reading-room. This is the exquisite and most practical arched room at the end of the North Library, one-third as lofty again as the other libraries *en suite*, where enormous space is gained by spanning it with a succession of arches, thus admitting a series of transverse galleries. The effect is not unlike that of one of the arcades of the Mosque of Cordova, and Moorish decoration is not unsuccessfully represented by the masses of coloured bindings, mostly in the morocco which Panizzi substituted for calf. It does not appear, however, that he was concerned in the design of this library, credit for which should probably be given to Sir Robert Smirke and the Rev. Josiah Forshall, then secretary and ruling spirit of the administration. About the same time the design seems to have been adopted for the "long room" constructed on the eastern side of the King's Library, whose skylights came just underneath the windows of the great building. These galleries, devoid of architectural pretensions, and irreverently described by Monckton Milnes as sheds and warehouses, nevertheless well answered their immediate purpose of providing for the overflow of books, and at this day accommodate a considerable part of the Oriental collection.

The necessity for increased library accommodation, nevertheless, far outran the attempts to meet it, considerable as these were in comparison with anything effected in former years. Panizzi's great report on the deficiencies of the library in 1845, backed by his considerable social influence, caused the augmentation of the grant for purchases to £10,000 a year, and a few years of this activity swamped the available space. All this time the interior court remained unoccupied by buildings, though Thomas Watts had pointed out the waste of room as early as 1836 in an article in the *Mechanics' Magazine*. Suggestions for making it available were offered between 1840 and 1850 by Mr. Hawkins, Keeper of Antiquities, and by Mr. Fergusson and Mr. Hoskins, architects, but the only one of these which contemplated the erection of a reading-room was Mr. Fergusson's, and his scale was most inadequate. Panizzi came forward with his plans, subsequently modified, on April 18, 1852, and carried them, after a tough battle with Sir Charles Barry, who, apparently taking his cue from the Crystal Palace, proposed to cover the court with a skylight, and use it for the exhibition of sculpture. The idea of the circular reading-room, whose walls should be merely books, and all the still more remarkable arrangements of the iron library adjacent, belong solely to Panizzi. The dome which adds so much dignity to the structure does not appear in Panizzi's plan, and was probably the conception of the architect, Mr. Sydney Smirke. It is not improbable, however, that useful hints may have been derived from the remarkable plan for a circular library put forth in 1835 by M. Benjamin Delessert, when the question of rebuilding the French national library was under consideration. M. Delessert, however, proposing to begin entirely *de novo*, and erect his library in an empty space, was able to conceive of his entire library as a circular building. This was not practicable at the Museum, where a quadrangular space had to be filled. M. Delessert's reading-room was evidently adapted from the ancient amphitheatre, and his plan has of late, though probably unconsciously, been developed by Mr. E. Magnusson, of the Cambridge University Library, with the interesting suggestion that the circle should be a spiral coil, resembling the shell of an ammonite, thus providing indefinite space for extension. This ingenious idea should not be allowed to drop out of sight.

It was supposed at the time that the additional space gained by the erection of the reading-room and its accessories would have sufficed the library until the end of the century, but the estimate proved fallacious. The need was met by the introduction of the sliding press, elsewhere described, which has solved the problem for the present, except as regards newspapers. It does not appear how these are to be provided for without some extension of the buildings, room for which has been happily provided by the acquisition of the surrounding houses and gardens.

No important example of library architecture, meanwhile, has been given at the Museum of late years except the White Wing (1880–88), which includes the newspaper reading-room and its annexes, extensive additions to the manuscript department, part of the Oriental Library, and the entire department of prints and drawings. The students' room and the exhibition room of the latter department are on a magnificent scale. The Oriental room is remarkable as the first instance of a room specially constructed to receive the sliding press. No grated ceiling being available as in the new library, stout iron bars have been stretched across, from which the presses depend. These have been made a foot too high, thus becoming unduly heavy when quite full, although not unmanageable. Eight feet appears to be the most suitable height for presses of this description. No step has yet been taken to occupy the ground recently purchased, whose disposition remains a problem for next century. It is to be hoped that a grand and consistent scheme for the whole will be adopted after due consideration, and rigidly adhered to, thus obviating the mere hand to mouth provision for pressing needs, and the timidity in allotting space, which are the causes of most of the architectural disadvantages of the British Museum.

CHAPTER VII

BRITISH PUBLIC LIBRARIES: ABERDEEN, BELFAST, BIRMINGHAM, BLACKBURN, BOOTLE, BRISTOL, CHELTENHAM, DARLINGTON, DERBY, DUBLIN, EDINBURGH, GLASGOW

In the following chapters short accounts are given of the architectural features of about sixty libraries in England, America, and on the Continent. The descriptions are brief, and are in nearly every case illustrated by plans, which will give a good idea of the arrangements of the buildings and disposition of the rooms. In the selection of the libraries to be described, an attempt has been made to choose representative examples of the different types of buildings likely to be of most use to the librarian and architect.

The Aberdeen Public Library was erected in 1892 from the plans of Mr. Alexander Brown of that city. It consists of three floors, the ground floor being chiefly occupied with the news-room, which is 66 feet by 45. It has been provided with stands for thirty-four newspapers, and has accommodation for 120 readers at the tables. The specifications of patents are also stored on this floor, and may be consulted in a small room opening out of the news-room.

The lending library is placed upon the first floor, over the news-room, but, as the site has a considerable slope, it also has an entrance direct from the main street. It is contained in a room 76 feet by 46. The books are arranged in cases which stand in the centre of the room, and a counter runs round three sides of the rooms, the borrowers being between the counter and the wall on three sides of the room, as shown in Fig. 66.

The reference library is a room of the same dimensions, on the floor above the lending library. It has seats for sixty readers. The total shelving of the library amounts to about 60,000 volumes. The cost of the building and fittings was £10,000.

The Belfast Free Library was erected in 1884, from the designs of Mr. W. H. Lynn. The main entrance to the building is placed in the centre of the principal front, and gives access to an entrance-hall 33 feet square, with a small enclosed lobby for a porter on the left, commanding both entrance-hall and newspaper reading-room. The lending library, which is 72 feet by 20 feet, has a space in front of the counter for the public 27 feet by 13 feet; it is on the right of the entrance, and is shelved for about 25,000 volumes, in double cases placed at right angles to the windows. The newspaper-room on the left is 61 feet by 30 feet, and has accommodation for about eighty readers.

From the entrance-hall a stone staircase leads to the reference library, upon the first floor. This is a fine room, 102 feet by 40 feet, and extends across the whole width of the building. It is lit from windows on two sides, and from a large domed skylight over the centre of the room, which is carried up through the next storey to the roof. The central area, 52 feet square, is used for readers, and seats about 150 persons. On the left of the entrance to the reference library, and

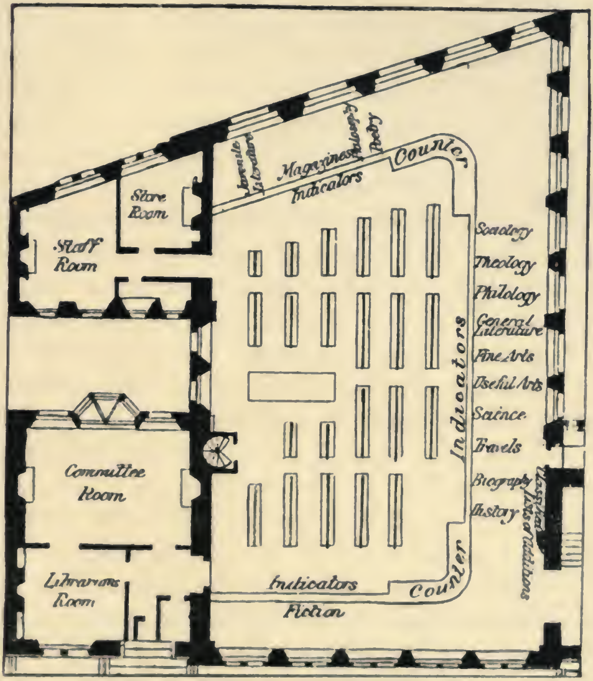


FIG. 66.—Plan of the lending department of the Aberdeen Public Library.

in the front of the building, is placed a reading-room for ladies, 20 feet square, and on the right the librarian's office.

The second floor is occupied with rooms for art gallery and museum, which are lit from the roof. Residence for a caretaker is provided in the north-east angle of the building, and the heating apparatus is placed at the rear of the building, the chimney being carried up inside a ventilation shaft, with which the reading-rooms are connected by conduits in the walls.

The central library at Birmingham was destroyed by fire on 11th January, 1879, and rebuilt and opened in June 1882. The new building is much larger than the one it replaces, although the site and elevation are practically the same. In the old building provision had been made for a patent library and a museum and art gallery. These are now housed elsewhere, and the space thus obtained is wholly occupied by the library proper. It is situated on a corner site, with its principal entrance placed at the end farthest from the corner. The vestibule is 32 feet by 12, and opens into a hall 28 feet by 60. Entrance is obtained here to the lending library and news-room, which are in one room, divided by pillars. The news-room is 100 feet in length by 64 in width, and 26 feet high. The lending library portion is a wing 82 feet by 75, and forms a square projecting from the longest side of the news-room, part of the space being occupied by a private staircase and rooms for the staff. The books are arranged in wall-cases and in a double gallery, and there is shelf-room for about 35,000 volumes.

The staircase to the reference library winds around the entrance-hall, and admits to two rooms of the same area as those below. They are lit by a range of clerestory windows fitted with stained glass, a series of groined arches connecting the clerestory with the ceiling, which is 50 feet high. Opening out of the wing is a room 30 feet by 21, containing the Shakespeare collection, and between this and the private staircase are a series of strong-rooms for the more valuable books. The books are arranged in wall-cases, which extend around each side of the rooms, with a gallery above, and shelf accommodation is given for about 150,000 volumes. Already the stock is 140,000, and the question of more shelving has become pressing. The addition of a stack-room, if ground can be obtained adjoining the library, would give the necessary room. The library will have outgrown its present accommodation in less than twenty years from its reconstruction, and so forms a striking illustration of the necessity of obtaining in the first place a site large enough for reasonable growth.

The branch libraries at Birmingham are all constructed upon the same principle—that of building one large room, which is shelved upon one or more sides for books, and has newspaper stands and tables for readers in the centre. Attention has already been given to this mode of planning in Chap. I., and nothing further need be said here than that while such a plan is cheap to work, it is noisy and unpleasant for readers who wish to study, and is decidedly unwholesome for the attendants, who are stationed for eight or more hours daily in the rooms.

One of the best of the branch libraries is that designed by Messrs. Cossins & Peacock, at Saltley, and opened in 1892. It is placed on a narrow site, and has an entrance at the corner, which gives admittance through a vestibule to the large reading-room. This is 82 feet by 32 feet, and has a carved roof of open timber-work 19 feet from floor to springing. The room is lighted on the front side by large mullioned windows, and the opposite side is broken up into arcades of similar shape and size, in which are placed the bookcases containing the lending library. The counter, which is 60 feet in length, runs down the room about 10 feet in front of the bookcases. There is a clock tower 10 feet square over the vestibule, with spire 70 feet in height. A notable feature of the façade is a series of panels in terra-cotta, forming part of a frieze over the windows. They were modelled by Mr. B. Creswick, and contain figures illustrating the principal trades pursued in the city. The cost of the building was about £4000.

The Derby Free Library and Museum was erected in 1879 from the plans of Mr. R. K. Freeman. The building is almost square, with its principal entrance in the centre of the main front. On the left of the entrance-hall are the ladies' reading-room and general news-room, and in the centre the lending library, 56 feet by 24, which is carried up to the full height of the building, and is lit from a lantern in the roof.

On the right of the library is the reference library, of similar size to the reading-room, librarian's office, &c. The first floor is used for the museum and art gallery, which are lit by lantern and ceiling lights.

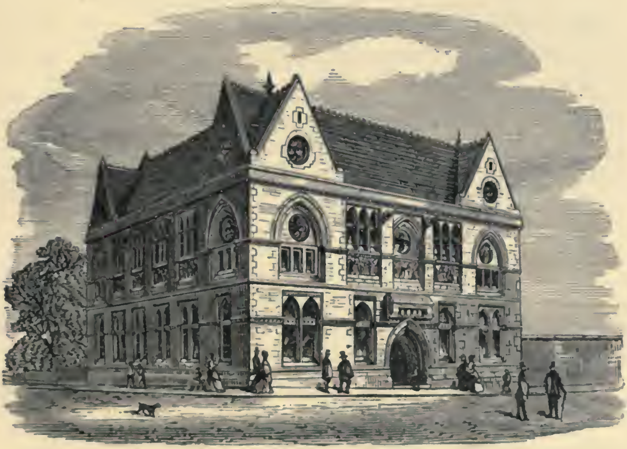


FIG. 67.—Free Library and Museum, Blackburn.

The Blackburn Library and Museum, an elevation of which will be seen in Fig. 67, is a stone-built edifice in mediæval Gothic style. In the interior of the building is a vestibule, 15 feet by 9, and a spacious hall, 24 feet by 20. On the right is a room for librarian and a news-room, 66 feet by 20, with accommodation for eighty readers. On the left is a large room, 69 feet by 35, which is divided by a glazed screen into a reference reading-room and a ladies' reading-room and two smaller rooms for students. The lending library is at the back of the building, opposite the entrance. It is 43 feet by 20, and has a storeroom adjoining nearly 2000 feet in area. The shelving capacity of the library is about 80,000 volumes. The upper floors are used for art and sculpture galleries and museum, the dimensions of the rooms being: art gallery, 56 feet by 35; sculpture gallery, 45 by 20; natural history museum, in two rooms, 66 by 20, and 62 by 16; and an industrial art museum, 69 by 35.

The Bootle Public Library and Museum stands upon a corner site adjoining the Town Hall, and has the advantage of light upon three of its sides and a portion of the fourth.

The newspaper reading-room occupies the front of the building, and is 43 feet by 28 feet. It has reading stands for thirteen papers, and also seats forty-two persons. The lending library is in the centre of the building, and is 32 feet square; and the magazine-room and reference library, 64 feet by 26, occupy the back portion of the site. The upper floor is occupied by the museum and art gallery and lecture-hall, which are approached by a staircase facing the lending library. Fig. 68 gives the ground plan of the building, and shows the general arrangement of the rooms. It will be noticed that good supervision over the reference library and the reading-room is obtained from the lending library.

The central library at Bristol is housed in an old building quite inadequate for the work which is being done in it. When the erection of a new building is contemplated, it is to be hoped that the corporation will be as successful in their plans as

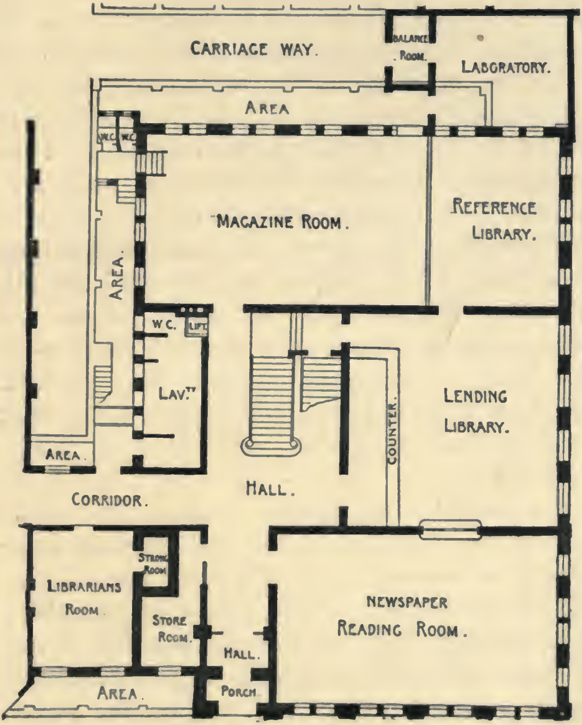


FIG. 68.—Ground floor plan of the Bootle Library and Museum.

they have been with the new branch library at St. Philip's, which was opened in 1896. This was erected from the designs of Mr. W. V. Gough, and is a handsome building of the Renaissance type, with a frontage of 100 feet to Trinity Street. The entrance is at the corner, and after passing through vestibules, each about 13 feet square, the newspaper reading-room is reached. It is a large hall, 78 feet by 33 feet, and 30 feet in height. It is lit by windows on either side, and the walls are of coloured brick, with a dado of wood.

The lending department is ingeniously arranged. It is triangular in shape, and the sides are about 30 feet in length. One side opens to the newsroom, and the other to a general reading-room and boys' reading-room, about 38 feet square. This arrangement gives good supervision from the attendants in the lending library to all parts of the building.

The new building, in which is housed the Cheltenham Public Library, School of Art, and Science School, was erected in 1889 from the designs of Mr. W. H. Knight. It occupies a central site, 114 feet in length, with an average breadth of nearly 80 feet. With the exception of the entrances to the two schools of art and science, the whole of the ground floor is used for library purposes. The chief entrance is planned centrally, and opens with a spacious hall 30 feet in length and 13 feet wide. On the left is the newspaper reading-room, which is 70 feet by 27 feet, with accommodation for over 100 readers. On the right is the reference library, 50 feet by 22 feet, with a storeroom for books behind. The lending department is at the back of the building, and is lit by windows on the north side and by a skylight. It is shelved for 25,000 volumes, in double cases 8 feet high, placed at right angles to the wall, and the room is high enough to take a second tier when needed.

The Edward Pease Library, Darlington, is built from the designs of Mr. George Gordon Hoskins of that town. The style of architecture is Renaissance, the materials employed being red sandstone and pressed brick and terra-cotta. It is situated on a corner site, with a frontage of 106 feet on the western and of 90 feet on the northern side, the main entrance being at the north-west angle.

The site is somewhat angular, and so the central hall or public lobby was purposely made irregular in form, in order that the other rooms might be properly squared. The library is only one storey in height, and access to the four public rooms is gained from this hall. Directly facing the entrance floors is the lending department, which measures 57 feet by 30. It is entirely lit from the roof, and the bookcases, to hold 32,000 volumes, are placed at right angles to the eastern wall. A counter with return, some 55 feet in length, runs the length of the room, and the issue desk is at the angle immediately behind the entrance doors. From this point the whole of the entrance-hall and lobby and the doors of the other rooms are easily seen, and the work of supervision thus materially reduced.

The newspaper reading-room is on the west side of the building, and is 51 feet by 30. It contains newspaper stands for thirty papers, and tables seating sixty-six persons. It is lit from the sides, and also from stained glass windows in the ceiling. The reference library is a smaller room in the north side, 36 feet by 29, shelved to contain 3000 volumes, and capable of seating forty readers.

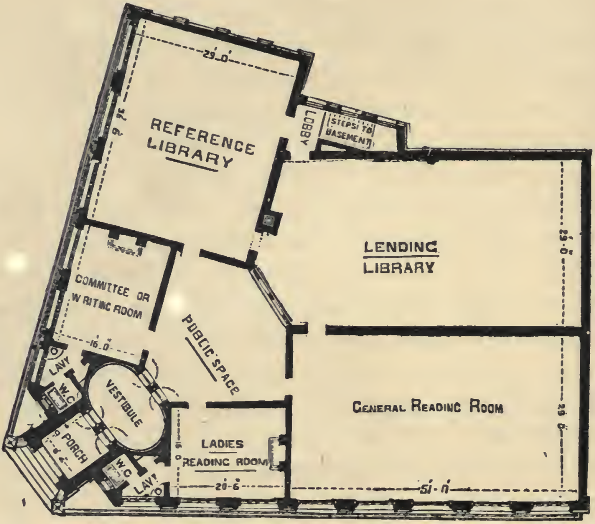


FIG. 69.—Ground plan of Darlington Public Library.

A reading-room for ladies is provided, 18 feet by 13, and a room of similar size to serve as librarian's office and committee-room. A plan of the building is given in Fig. 69, and it may be stated that, as it was erected as a memorial, no expense was spared by the donors to make it in every way worthy of the memory of its founder.

The new building of the National Library of Ireland, Dublin, was opened on 30th August 1890. It forms the northern boundary of an open quadrangle off Kildare Street, Dublin, and faces the museum of science and art on the south side. It was built from the designs of Messrs. T. M. Deane & Sons.

The special features of the building are the isolation of the large central reading-room, and the adoption in the large book-stores on either side of the stack system of bookcases. The reading-room is on the first floor, and is approached by a colonnade, large vestibule and hall, which run through the centre of the building, and give access to the staircase. It is of horse-shoe shape, with a greatest length of 63 feet, and width of 60. It is nearly 50 feet high in the centre, and is lit by a large central dome and side windows high in the walls. The lower part of the walls are shelved for books of reference, to which the readers have unrestricted admission.

The remainder of the stock is kept in two book-stores right and left of the reading-room, and connected therewith by a short corridor on either side. Of these stores, the one nearest Kildare Street is only as yet completed. The arrangement of the floors and bookcases in the storerooms was suggested by Mr. William Archer, the first librarian, in a pamphlet he published in 1881, entitled

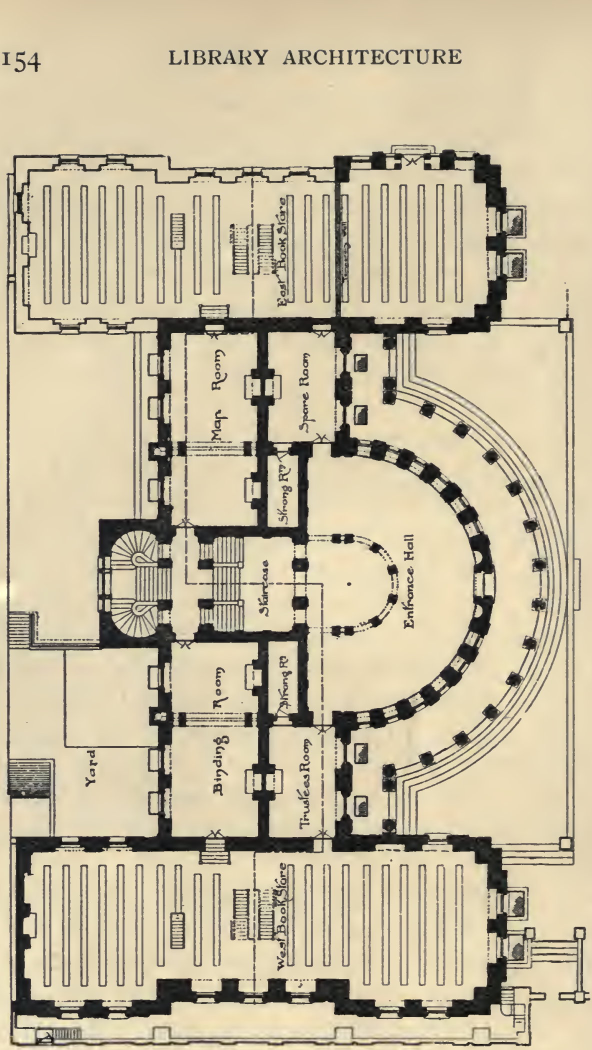


FIG. 71.—National Library of Ireland—plan of the ground floor.

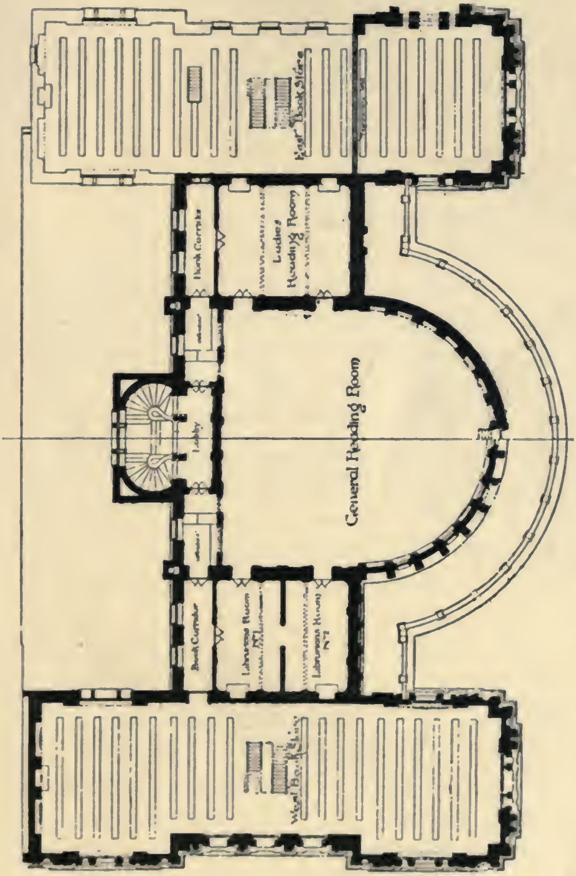


FIG. 72.—National Library of Ireland—plan of the first floor.

"Suggestions as to Public Library Buildings," and was carried out by Sir Thomas Deane, the architect. The stores are divided into three storeys by two floors, the first 16 feet 8 inches, and the second 19 feet 1 inch in height. These are again divided horizontally by perforated iron floors, making in all four tiers or storeys of bookcases. Across the stores 26 double bookcases, between 7 and 8 feet in height, are placed at nearly equal distances apart, the average width of the gangways being 3 feet. They stand at right angles to the windows, and so are fairly well lighted; but as the architect was prevented by æsthetic considerations from giving to the side walls a sufficient number of windows, it has been necessary to provide accumulators to supply electric light during the daytime in several of the divisions. There are eight uprights in each bookcase in the central portion of the book-stack, where the room is slightly narrower than at the ends, and nine in the latter. In the lower storey they are set in the concrete floors, and fixed in the ceiling. In the upper they are also set in concrete, but do not rise to the roof, and the bookcases are steadied by iron bands running along their tops. This method of construction strengthens the whole building, for the uprights connect the two concrete floors, and the weight of the books is evenly distributed over the whole structure. The different floors are reached by straight staircases placed in the centre of the room.

An examination of the plans given in Figs. 71–74 will show that the stores are well placed for ease and rapidity of service, for the entrance from the reading-room is at the middle point, not only horizontally but vertically, the second storey of the book-stores, forming the third floor, being on the same level as the reading-room floor. Thus there are two stacks of bookcases below the level of the reading-room, one above, and one on the same level. The length of the book-stores is 101 feet, and height 49 feet 3 inches; the average breadth is 33 feet. It may be estimated that 200,000 volumes can be

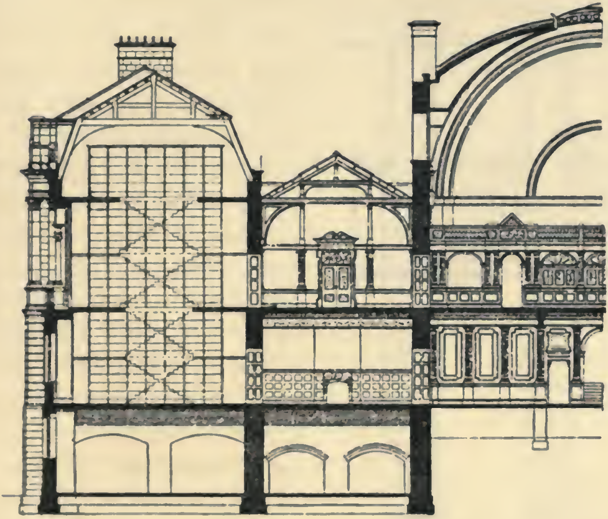


FIG. 73.—National Library of Ireland—section through the building, showing the arrangement of the book-stack.

shelved in each of them. The completion of the building is an urgent necessity, and it is to be hoped will take place at an early date.

The Edinburgh Public Library was erected in 1890 from the designs of Mr. G. Washington Browne. It is in the French Renaissance style, and may be said to be one of the most artistic buildings in the city. The general plan is that of a Greek cross for the three great public rooms, with staircases in the re-entering angles. The latter are roofed at a somewhat lower level than the main building, which is carried to a greater elevation, and crowned with a cornice and balustrade. The arms of the cross are covered with flat roofs, and subordinated to the central figure of the composition, which is a steep pitched roof carried up over the intersection of the cross containing the dome of the reference department, and terminating in an ornate *flèche*.

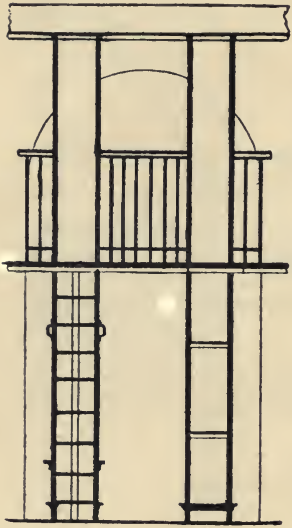


FIG. 74.—National Library of Ireland—section through a bookcase and gallery.

The public rooms are arranged upon the top three floors, the building consisting of five, the fourth from the bottom being at the level of George IV. Bridge. The basement, on the level of the Cowgate, was occupied by the boilers, engines, and dynamos for supplying the electric light, but the noise and vibration caused by the machinery was found to be a nuisance, and it has recently been resolved to purchase the light from the corporation and use the rooms for book storage and for the files of newspapers and magazines.

The news-room, which is on the floor immediately above this, but below the level of George IV. Bridge, is reached from the latter by a wide and easy stair. The room is in the form of a Greek cross, its greatest length being 90 feet, and its breadth 72 feet. It is well lighted from four sides by large mullioned and transomed windows. Eight massive Ionic columns support the panelled ceiling, while the walls to a height of 8 feet are lined with specially designed Faience and decorated tiles. Provision is made for displaying fifty daily newspapers on stands at right angles to the walls, and the weekly papers and magazines are placed on tables in the centre of the room, at which 132 readers can be accommodated. Entering from the news-room is a juveniles' library, with a stock of 7000 volumes. Tables of similar design and construction to those used in the news-room are provided for the readers in this department.

The lending library (Fig. 75), on the level of George IV. Bridge, is of the same form, and lighted in the same manner, as the news-room.

The shelving is arranged on the alcove system, and will hold about 48,000 volumes, within reach of any person of ordinary stature without the aid of steps or ladders. The counter forms three sides of a square, and is 110 feet long; on it are placed at intervals twelve blocks of Cotgreave Indicators, the spaces between each being used for giving out and taking in books. In the centre of the room is a large desk-table, on the four

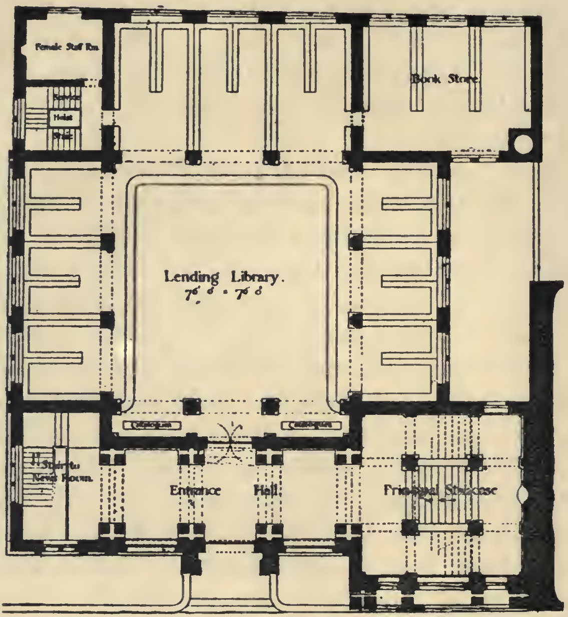


FIG. 75.—Plan of lending department of the Edinburgh Public Library.

sides of which are catalogues and application forms.

The reference library (Fig. 76) occupies the top floor, the staircase leading to which forms

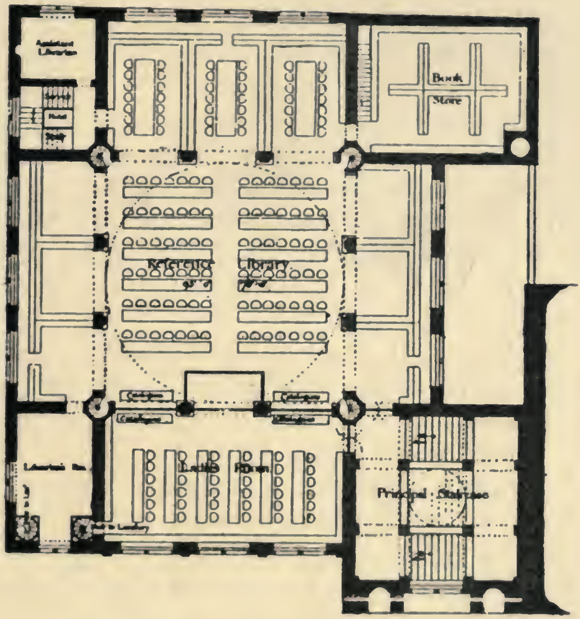


FIG. 76.—Plan of the reference department of the Edinburgh Public Library.

one of the most interesting architectural features of the building. The plan follows the Greek cross form, as in the floors below; the square space in the centre of the room is provided with tables, at which 100 readers can be seated. Over this rises the dome, from which, as well as from the windows on the four sides, light is admitted to the room. The shelving is on the same principle as in the lending library, but a gallery tier is carried round three sides of the room, access to which is obtained by winding stairs in the four projecting angles of the room. The shelving already fitted gives accommodation for 40,000 volumes, and provision is made for the addition of a third tier of shelving being added when required. The basement is also shelved for the bound volumes of newspapers and magazines, and the flat immediately above, under the newsroom, is used as a book-store for reference books.

The building is lighted by electricity supplied by the corporation. Fifteen arc lamps are used for the illumination of the large spaces, while 120 incandescent lamps light the entrance-hall and gateway, the alcove recesses, the public and service stairs, and the board and librarian's rooms.

The library was the gift of Mr. Andrew Carnegie, who gave the sum of £50,000 for the purpose of erecting it.

The Mitchell Library, Glasgow, is different from most of the British public libraries, inasmuch as it is a reference library only, and has no newspaper reading-room or lending department.

For some years it was situated in rented flats, but in October 1891 it was removed to a building formerly used by the Water Commissioners as their offices. It is interesting to note how it was altered for its present use, and so adapted as to make a building well suited for its new purposes.

The street frontage is 120 feet, and the entrance is placed at the one end. The entrance-hall, which is 16 feet wide, gives access to a reading-room at the back, 78 feet by 45. Occupying the floor of this room are fourteen tables, each seating fourteen persons, a total of 196. The walls have no windows, the lighting being from the roof; and bookcases are carried up to a height of two storeys, those in the upper part being arranged in alcove cases, carried on a gallery 10 feet deep, as shown in Fig. 77. The ground floor of the front of the building is shelved for about 30,000 of the most popular books, a counter 48 feet in length separating it from the reading-room. A railing runs around the latter at a distance of about 5 feet from the wall. The rooms on the first floor (Fig. 78) are reached by a staircase ascending from the entrance-hall, and their level coincides with that of the gallery in the reading-room; they are arranged for the use of magazine readers, students, and for ladies. The magazine-room has seating accommodation for 104 persons, and is lit from the street on the one side, and the upper part of the reading-room on the other. The ladies' room seats thirty-two, and the students'

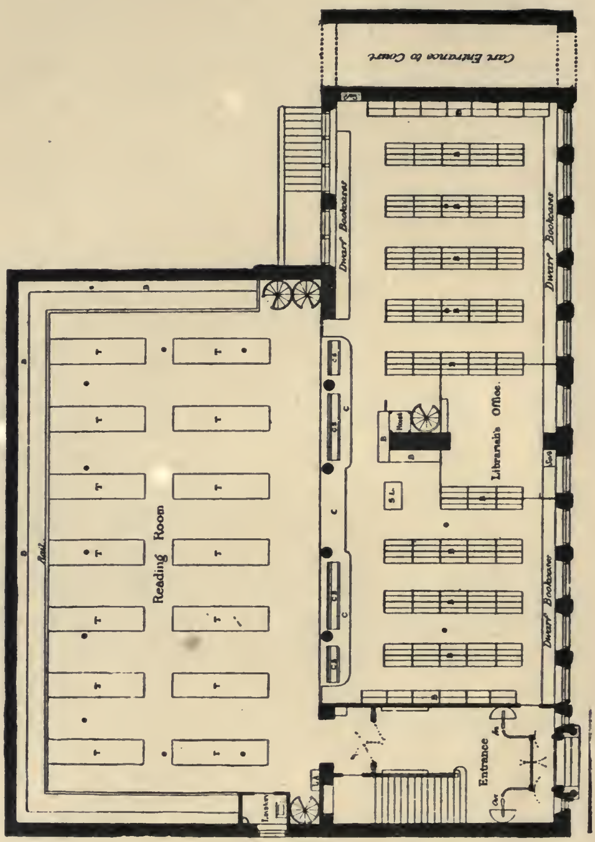


FIG. 77.—Ground floor plan of the Mitchell Library, Glasgow.

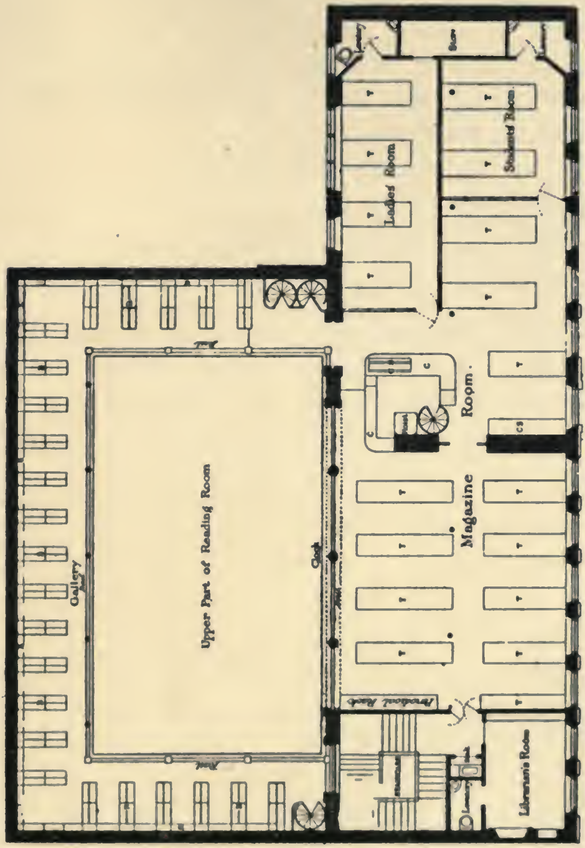


FIG. 78.—Plan of first floor of the Mitchell Library, Glasgow.

room twenty-four. The second floor is shelved for books, and contains those least in demand. There is room altogether for about 150,000 volumes. The building is lit by electricity, a statement of the yearly cost of which will be found on page 30.

CHAPTER VIII

BRITISH PUBLIC LIBRARIES (*continued*): LIVERPOOL, MANCHESTER, NEWCASTLE-UPON-TYNE, PRESTON, ST. HELENS, WIDNES, WIGAN, WORCESTER

The Liverpool Free Library, Museum, and Art Gallery form a spacious and handsome suite of buildings fronting the eastern end of the St. George's Hall, and divided from it by the roadway. The three buildings, to which will shortly be added Mr. Mountford's new building for technical schools and extension of the museum, are of classical character, and form a noble group in architectural keeping with the hall opposite.

The westernmost building is the museum and library, erected by Sir William Brown at a cost of about £60,000 from the designs of Mr. T. Allom, and opened in 1860. The most eastern is the "Walker" Art Gallery, built in 1877 by Sir A. B. Walker, Mayor of Liverpool. The "Picton" Reading-room, opened in 1879, was built by the corporation on the vacant ground between the "Brown" Museum and the "Walker" Art Gallery, and so forms the connecting link of the two buildings. It is named after Sir James A. Picton, who was for many years the chairman of the library committee.

The entrance to Sir William Brown's building is by a flight of steps high enough to give a good light to what must be called the basement, but which from the slope of the ground is practically the ground floor of the building. The east wing alone is used for library purposes, the remainder being devoted to the museum. In the basement at the front of the building the central lending library is placed in quarters far too cramped for successful work. At the back is the library of patents, and storeroom for part of the reference books.

On the ground floor the newspaper reading-room, 40 feet by 28 feet, and librarian's room, 33 feet by 28 feet, occupy the front of the wing. Opening out of the newspaper room is a reading-room, 80 feet by 40 feet, which is used by readers of fiction, the illustrated papers, and for lighter literature generally. This room seats about 250 persons, and is a useful means of separating the studious reader, who is sent to the "Picton" reading-room, from the reader who merely wants an interesting book for recreation. Parallel with this room is the book-store, 80 feet by 24 feet, which is lit from windows on one of its longest sides, and is shelved in two tiers, with a gallery. A second book-store of similar size is placed over it, on a level with the floor above. At the back of the building are other rooms for cataloguing and administrative purposes, and the staff. The librarian's office, in the front of the building, is specially shelved with glass bookcases for the reception of the rarer and more costly works of interest or value.

The "Picton" reading-room, although a separate building, is connected by a corridor with the "Brown" Library. It is a circular hall, 100 feet in diameter, and was designed by Mr. C. Sherlock, the constructional iron-work of the floor being designed by Mr. J. N. Shoolbred. The room is 32 feet high to the spring of the ceiling, and 56 feet at the highest point, and will seat 260 readers. It is entirely lit from a circular opening in the roof 24 feet in diameter. The lecture-hall underneath, which is of the same area, and seats 1500 persons, is 27 feet high, and is cut out of the solid sandstone on which Liverpool is chiefly built, the rock being cut into terraces to form the raised seats of the auditorium.

The reading-room is shelved all round to a height of about 20 feet, the upper shelves being reached by a gallery; it is contemplated placing another tier of shelving above those now *in situ* with a second gallery whenever more shelf-room is required. There are also 16 double bookcases, 8 feet in length, and 8 feet high, projecting from the walls, forming radii of a circle. The readers are seated at tables in the centre of the room, and formerly some were allowed to use tables in the alcoves formed by the double bookcases; but this privilege has now been withdrawn, the "open access" thus allowed to valuable books being found to be too great a strain upon the honesty of some of them.

The lecture-hall underneath was first intended for use as a book-store; but this was abandoned in favour of an aquarium, and then the latter, in its turn, was dropped for its present use, the committee being helped in their decision by the fact that lectures given in a small lecture-hall on the first floor of Sir William Brown's building were found to be much appreciated, and of great educational value.

It seems a pity that the new building for museum extension and technical schools, which is to adjoin the west side of the "Brown" Library, is to be used for the purposes indicated. The lending library, as I have before stated, is in an unsuitable room in the basement, and the newspaper room is admittedly overcrowded, and much too small for the use made of it. The other departments of the library are well housed, and have room for expansion and growth, but the two departments which in other towns form the most popular side of the library work, are crippled by an unsuitable environment. The remedy is very simple, and has been pointed out by one of the competitors in the recent competitions for the extension plans. It is to find another site for the new schools of science and art, and use the new building entirely for museum and library purposes. On the ground floor suitable rooms for a new lending library and a second news-room could easily be made, and the whole upper floor, when combined with the old building, would form a noble suite of galleries for museum purposes.

The Manchester Public Library system consists of a central reference library, with branch lending libraries and reading-rooms scattered over the city, so as to bring the advantages of the library as near to the homes of the people as possible.

The reference library is "cabin'd, cribb'd, confined" in the old Town Hall of the city, and has long outgrown the accommodation there provided.

It is strange that the town which was the first in Britain to obtain parliamentary powers to establish a public library should be content with a makeshift building as a home for its splendid collection of books. It has now in its reference library over 100,000 volumes, and by common consent the quality of the collection is second to none. Liverpool, as we have seen, has housed its central library in buildings worthy of the city, but Manchester in this respect has lagged behind, and has yet to erect a suitable home for its literary treasures.

In Fig. 79 are given plans of the ground and first floors of the central reference library. Study of these will show the many disadvantages under which the library suffers. The large reading-room is shelved around its walls to a height of about 20 feet for the books most in demand, and the remainder of the stock is scattered over different rooms in other parts of the building. On the ground floor is a lower reading-room — a well-fitting name, for its ceiling is low, and the last time the writer visited it he wondered how any one could exist in it for many hours without asphyxiation.

The branch libraries at Manchester, however, are worthy of the city. They are now fifteen in number, and most of them have, in addition to the ordinary accommodation of lending library and reading-room, a special room for boys. This is a feature of great usefulness, and other libraries would do well to consider the wisdom of providing such a room.

The lending library at Gorton—the tenth established by the corporation of Manchester—was opened on 5th May 1894. The building is situated at the junction of Gorton Lane and Belle Vue Street, West Gorton. The shape of the site suggested an octagonal plan for a portion of the building, and this has been adopted, the section at the union of the two streets being an octagon measuring 29 feet 6 inches in diameter,

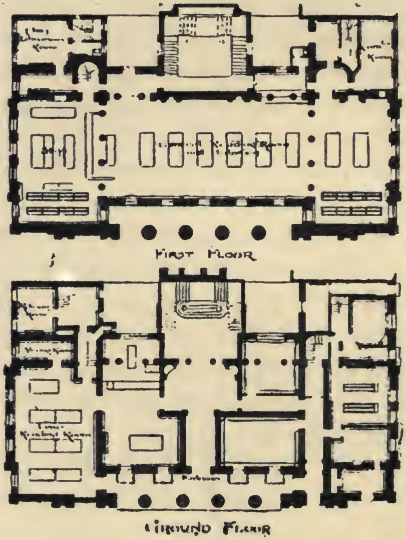


FIG. 79.—Plans of the Central Library, Manchester.

communicating by wide-arched openings with two wings, each 21 feet wide, facing the streets, the portion between them forming an open area for light. The ground floor (Fig. 80) is kept up 6 feet above the street level in order to give a good light to the basement floor, in which is a boys' reading-room, book-store, and heating apparatus. The entrance to the building is in Belle Vue Street, and a wide staircase leads up to the first floor and down to the basement, the staircase hall having an octagonal end with large windows lighted from the area. To the left of the entrance, on the ground floor, is the library, which, with the rooms for the attendants, occupies the whole of the storey. The bookcases, counter for borrowers, catalogue desk, &c.,

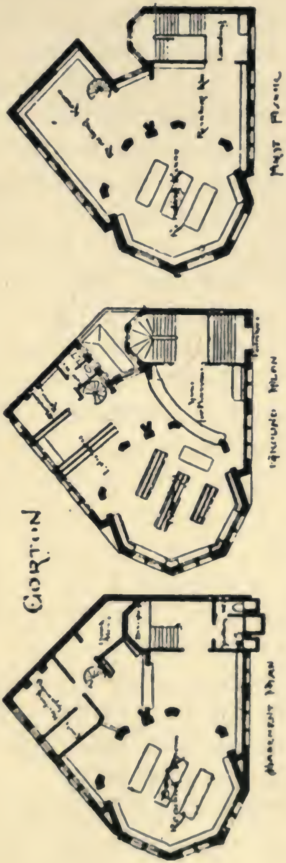


FIG. 80.—Plans of the Gorton Branch Library, Manchester.

are all constructed of pitch-pine, stained and varnished.

The first floor is entirely occupied by the reading-room, and is fitted up with newspaper racks and reading tables, and a small bookcase for reference books. It is a lofty room, ceiled half-way up to the roof, and lighted by windows on all sides, skylights over the wings, and a lantern light over the octagon. Special attention has been given to the artificial lighting and ventilation throughout. A number of flues have been carried up in the walls, and into these are passed the tubes from the ventilating sunlights. For the inlet of fresh air, hopper casements are fixed in many parts of the building. The warming of the building is accomplished with hot water in pipes and radiators.

The elevations are faced with grey bricks, with red terra-cotta in windows, door, cornice, and string courses. A feature has been made of the octagonal, which is covered by a hipped roof, and this is crowned by a square clock turret, the total height from street level to top of iron vane being about 81 feet.

The cost of the building and fittings has been about £4100, and the work was carried out from the designs of Messrs. J. W. & R. F. Beaumont, architects, Manchester.

A fine range of municipal buildings has been erected in Openshaw, and have been provided jointly by the Manchester Corporation and the Legatees of the late Sir Joseph Whitworth. They were opened in 1894, and are built from the designs of Messrs. Beaumont of Manchester. In the buildings there is provided a library, containing space for 20,000 volumes, a public hall, a technical school, and, what is a new departure in municipal buildings, a coffee-tavern and chess and billiard rooms. The total cost, including the site, has been about £15,000, and towards this the Whitworth Legatees have contributed £8500. The whole site contains an area of about 1830 square yards, and is almost entirely covered by the buildings. As the site has frontage to two streets, ample entrances and exits are provided to the different departments.

The library is entered from Ashton Old Road, and comprises lending library, with space for borrowers 49 feet by 30 feet, reading-room 60 feet by 40 feet 6 inches, and boys' reading-room, 42 feet by 29 feet, with separate entrance from South Street (Fig. 81). The rooms are divided from one another by glazed screens, which insure complete superintendence of all parts of the rooms by the attendants in the library. The library is lighted from large windows looking into Ashton Old Road, and the bookcases are fixed at right angles to the windows, giving space for about 10,000 volumes. The reading-room is in two parts, the larger part being 60 feet by 30 feet. and the smaller part 47 feet by 9 feet, divided from one another by an arcade of four semicircular arches carved on polished granite columns. The larger part has an open timber roof, finished the whole length of the room with skylights of

Heywood's patent glazing; the walls are faced with bricks, the lower part, to a height of 4 feet 6 inches, being a dado of golden brown-glazed bricks, and the upper part faced with buff bricks, relieved with bands of red pressed bricks; the arches and jambs of windows are also finished with red pressed bricks and terra-cotta; the windows are glazed with leaded lights. Newspaper racks are fixed on both sides of the room, and two rows of reading tables, accommodating about eighty-four readers, run down the full length of the larger part of the room.

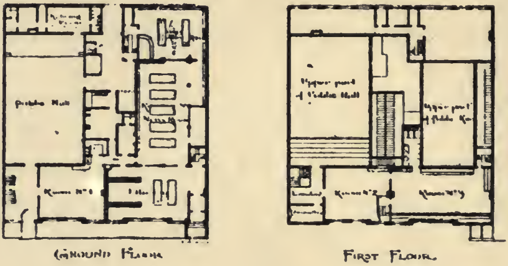


FIG. 81.—Plans of the Openshaw Branch Library, Manchester.

The boys' reading-room is lighted from South Street, and contains reading tables and forms, with accommodation for about 120 readers. A separate counter and bookcase are provided in this room. A room for the use of the assistants, fitted up with small cooking range, and lavatory accommodation, is provided in the basement.

The central public library at Newcastle-upon-Tyne adjoins the old building of the Mechanics' Institute, with which it is incorporated. It was erected in 1882 from the plans of Mr. A. Fowler, at a cost of about £22,000 for buildings and fittings.

The front of the façade is 175 feet in length, and the depth of the building varies from 90 feet to 35 feet. The principal entrance is placed in the centre through a portico, 30 feet long and 8 feet wide. This is ornamented with massive stone columns supporting an entablature, from which springs a continuous row of balustrades running the entire length of the front. The panels over the door and windows are carved with sculpture emblematical of local celebrities and trades. The bays at each end of the building are furnished with a medallion cornice, surrounded by the balustrade, and the roof is semicircular in form. The building is set back a little from the main thoroughfare, and is protected by a dwarf wall surmounted by ornamental railings.

On entering from the portico a large hall is reached, with a grand staircase to the first floor facing the entrance doors, as shown in Fig. 82. To the right is the news-room, measuring 43 feet by 28 feet, with an irregular shaped annexe 30 feet in length. In this room accommodation is given to about forty newspapers on reading stands, and sixty readers at the tables. On the left of the entrance-hall is the lending library, which is contained in two rooms, one a rectangle, 60 feet by

42 feet, and the other of horse-shoe shape, 60 feet by 36 feet. The books are arranged in wall cases around the room, and in double bookcases placed at right angles to the north and south walls. Shelving for about 50,000 volumes is supplied in the two rooms. The centre of each room is used by the public, and a counter for indicators is run around both of them. In the entrance-hall, and on the staircase and landings, is some fine statuary by the Newcastle sculptor, John G. Lough.

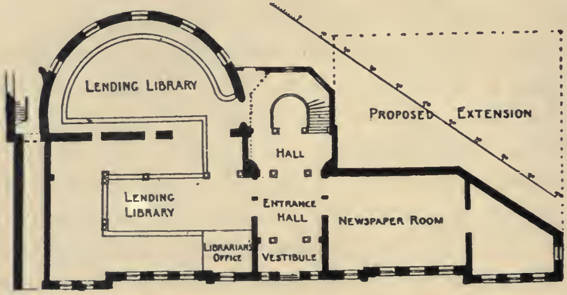


Fig. 82.—Plan of the ground floor of the Newcastle-upon-Tyne Public Library.

The reference library occupies the whole of the first floor, and runs the whole length of the building. It comprises a series of rooms opening into each other, as shown in Fig. 83. In the centre room, which faces the entrance doors, is placed the public card-catalogue and attendants' desk. The books are shelved in wall cases 8 feet in height, which are run around the whole library, and have a narrow counter in front of them. There are no side windows, the lighting being from skylights, and wall space is provided for a gallery when necessary. Tables are placed in the centre of the rooms, which will seat fifty readers. The semicircular room over part of the lending library is also used for a magazine room, and several smaller rooms are also provided on a second storey in the bay and central part of the building. In the basement there is a large storeroom for unpacking boxes, &c., and the usual accommodation for heating and other purposes.

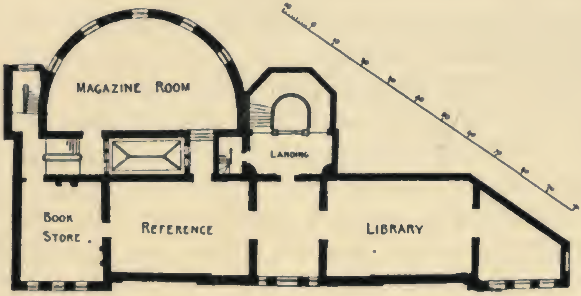


FIG. 83.—Plan of the first floor of the Newcastle-upon-Tyne, Public Library.

The building was lit by gas until 1884, when great damage was done by an outbreak of fire, caused through defective workmanship in the flues carrying away the products of combustion from the sunburners. The electric light was afterwards installed, and is now in use: a statement of the annual cost will be found on pages 29, 30.

Reference to the plans will show that the library is considerably narrower on one side than on the other. The adjoining land was fortunately vacant, and has been recently acquired by the corporation. It is proposed to extend the news-room, which is the most congested part of the building, by continuing it outwards. A large book-store for the reference department could be placed over it, and so additional room be found for the rapidly increasing number of volumes.

The branch library at Elswick, which was opened in 1895, was the gift of Alderman W. H. Stephenson, and is notable as providing other accommodation than that ordinarily given in libraries established under the Public Libraries Acts. The building is 86 feet by 43 feet, and comprises two floors. On the ground floor there is a ladies' reading-room, a room for games, committee room, and a restaurant, the rent from the latter being expected to provide a large share of the annual cost of maintenance. The upper floor, which is reached by a separate entrance, consists of one large hall, 70 feet by 36 feet, with raised platform and retiring rooms. This is used at present for a newspaper and magazine reading-room, and will shortly be fitted with shelves for use as a lending library also. One of the conditions of the gift is that the donor and his family shall have the right to use this room on certain days for public and social meetings and lectures, but political and religious debates and discussions are prohibited. How this arrangement will work remains to be seen. If the library work is to be successful, it should be continuously carried on, without liability to interruptions by the room being used for other purposes. The wishes of the donor would have been better met by the erection of a separate lecture-hall, and not by trying to make one room answer both purposes. The cost of the building was about £4000, and it was designed by Mr. John W. Dyson of Newcastle.

The Harris Free Library and Museum, Preston, is one of the most important buildings erected in England of late years. It is designed by the architect, Mr. James Hibbert, in the Greek Ionic style, and has cost, with its fittings, nearly £100,000. In choosing this style of architecture, Mr. Hibbert says, that as the Hellenic race reached the highest standard in plastic arts, literature, and geometrical science, the suitableness of the style for the purposes of a building which is to be a repository of knowledge, of examples of the arts, and of specimens illustrative of the sciences, will be admitted by all, and he has therefore sought to plan a building which shall be a work of permanent value, and an example of memorial art.

The building has four frontages; its principal elevation, which is 130 feet long, is on the west, looking over the market-place. The portico consists of six massive columns, with bold capitals, and is surmounted by an overhanging cornice, the tympanum being filled with a group of sculptured figures, with a carved inscription underneath, "To

Literature, Science, and Art." The frontages on the north and south sides are 170 feet in length, and on the east 130 feet. The building contains three floors above the street level and a basement. The ground floor contains news-room, 29 feet by 55 feet, magazine-room, of same size, rooms for the specifications of patents, and lending library, each 50 feet square. The central hall is 54 feet square, and has a staircase which admits to the reference library on the first floor. This is contained in two rooms, each 120 feet by 30 feet. On this floor there are also smaller rooms for games, conversation, &c. The upper floor is wholly devoted to the museum and art galleries. Shelving is provided for 90,000 volumes.

The St. Helens Public Library occupies the whole of the ground floor of the "Gamble" Institute, which was presented to the town by Colonel Gamble, C.B. It was opened for public use in 1896, and was built from the designs of Messrs. Briggs & Wolstenholme, at a cost of about £30,000. (See Fig 84.)

The entrance gives immediate access to the lending library, which extends 56 feet back. An oak counter, 60 feet in length, is provided for indicators and serving purposes. A special feature of the counter is a revolving bookcase, holding about 100 volumes, for the display of recent additions. The front of the case is covered with wire-netting, through which the titles of the books can be read by the public.

The newspaper and magazine reading-room is

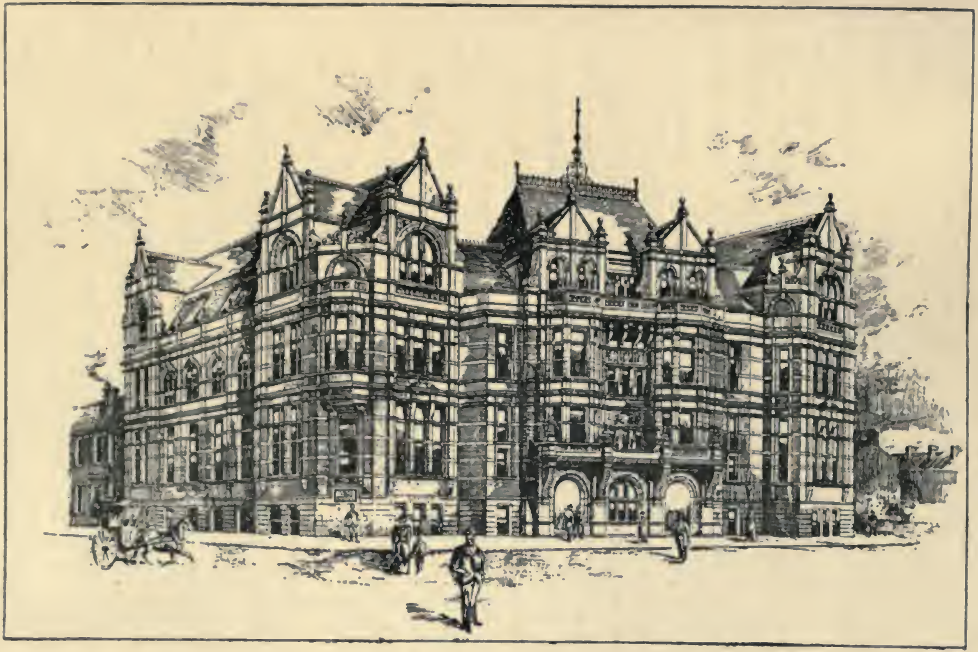


FIG. 84.—The Gamble Institute, St. Helens.

about 114 feet by 32 feet. It is fitted with reading stands for fifty papers, and also seats ninety readers at the tables. The reference library is 50 feet by 32 feet, and is shelved for about 20,000 volumes. A reading-room for boys, 32 feet by 21 feet, is placed in close proximity to the attendants in the lending department, from which direct supervision is obtained. There is also a reading-room for ladies, of similar size. The basement contains a large book-store, which communicates with the lending department by an iron staircase and book-lift. The ground floor is 7 feet above the street level, and so ample light is obtained from side windows. The shelf capacity of the building is for upwards of 50,000 books, but this can be considerably increased when necessary by the erection of a second tier of bookcases. The building is heated and ventilated on the Blackman system, and is lit throughout by electricity, 800 lamps of 16 candle-power being provided.

The free library at Widnes forms part of a large building, in which is also situated a technical school. It was built from the designs of Messrs. Woodhouse & Willoughby of Manchester, at a cost of about £12,000, and was opened for public use in 1896.

The library is separate, and divided from the other parts of the building by an open area 21 feet wide. On the left of the entrance-hall is the news-room, 22 feet by 40 feet, which is one storey in height, and has an open timbered roof. On the right of the hall is a room for ladies, 20 feet by 13 feet, with a private room for the (lady) librarian, 20 feet by 10 feet, communicating with it. At the back of the news-room, with a separate entrance from the side street, are the lending and reference libraries, and on the other side of the central corridor is a reading-room for boys.

The lending library is a room 40 feet by 24 feet, and the attendants' desk is placed against a clear glass screen with a hatchway in the wall of the news-room, so that control of the two rooms can always be exercised. The books are shelved in double cases placed at right angles to the desk, and the borrowers have access to the shelves. In the corner of the room is a staircase to a book-store above, with a storeroom for newspapers and periodicals. The boys' reading-room is 21 feet square, and is lit from the area. It is open on one side to the librarian's room, which it adjoins, and on the other to the attendants' desk in the lending library, from which it is separated by a corridor 8 feet in width.

The Wigan Public Free Library was erected from the designs of Mr. A. Waterhouse, R.A. It consists of a main building with cross gables at each end, the central portion forming a recess supported by buttresses. A bold skyline is obtained by the use of dormer lights, and in the principal front a distinguishing feature is produced by leaded windows following the line of the staircase.

The entrance-hall contains a granite column supporting two arches, through one of which access is gained to the staircase, while through the other the librarian's room is reached. With the exception of this room, the whole of the ground floor is devoted to the lending library and reading-rooms, which are separated by a low partition. The reference library, on the first floor, occupies the same area as the lending library and reading-rooms. It is divided into eleven bays, with a light gallery round each. There is a fine hammer-beam roof, and the decorations, though plain, are effective. There is accommodation in the building for a resident custodian, and a room is provided for the use of the committee.

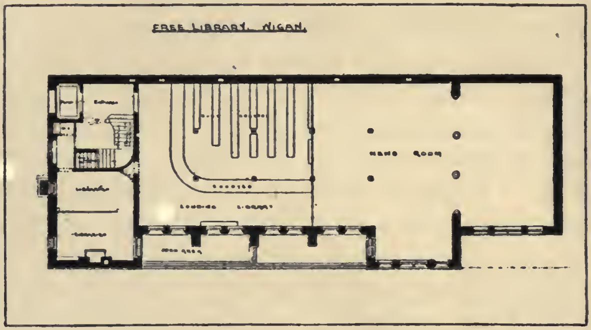


FIG. 85.—Plan of the ground floor of the Wigan Public Library.

The length of the reference department is 81 feet, and its breadth 37 feet 3 inches, except at the further end, where it is 46 feet. The middle of each bay is 13 feet. The bookcases are 7 feet in height from floor to gallery, and an additional

7 feet from gallery to top; they are 13 feet in length, divided into four compartments. The bookcases in the lending library are 18 inches higher than those in the reference library.

A noticeable feature at Wigan is a special building for boys, which was opened in 1895: it is called after the donor, the "Powell" Branch Boys' Reading-room. The building is three storeys in height, viz.: basement; reading-room and caretaker's rooms on ground floor; and lecture-hall, committee room, and retiring room on first floor—the principal room on each floor being 56 feet by 36, all lofty and well lighted. The reading-room floor is of wood blocks laid in concrete, and the room is furnished with light tables for reading, with seats, chairs, long counter, and bookcases. A platform for entertainments is fixed in the lecture-hall. A system of open shelving has been adopted, by means of which the youthful book-lover may choose his own book without having recourse to the catalogue, and at the same time the volumes will be under proper supervision.

The Worcester Public Library forms a portion of the new Victoria Institute, designed by Messrs. Simpson & Allen, and was opened in 1895. The whole of the ground floor (Fig. 86) is used for library purposes, the other floors being occupied by a museum and art gallery and the technical and art school.

The principal entrance is in the centre of the building, and opens into a large vestibule, from which access is gained to the committee room and reference reading-room on the left, the lending library in the centre, and the news-room on the right. The news-room is 84 feet by 22 feet, and seats eighty readers at the nine tables, and has reading stands for twenty-eight papers. It is well lit by windows on one side, and is under supervision from the lending library, from which it is separated by a series of glass screens running the whole length of the room.

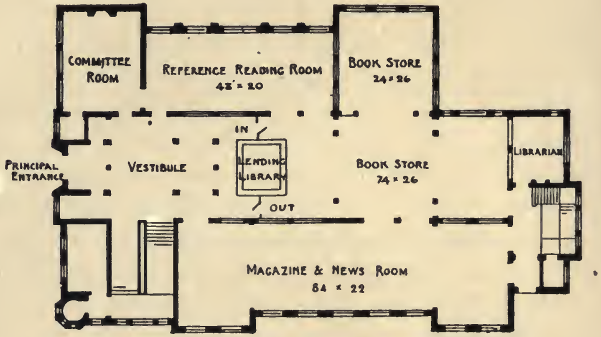


FIG. 86.—Ground plan of the library, Victoria Institute, Worcester.

The reference reading-room is 48 feet by 20 feet, and seats forty-two persons. The lending library is arranged upon the "open access" principle. A square enclosure for the attendant immediately faces the entrance doors, the readers entering by a gate in the left hand side, and leaving by a similar gate in the right. The books are shelved in cases

7 feet 4 inches in height, which are placed at right angles to the attendants' desk. Shelving has been provided for 20,000 volumes, but further storage is available in a large book-store adjoining the reference library. Fig. 86 shows the disposition of the rooms upon the library floor, and the arrangement of the bookcases.

CHAPTER IX

LONDON PUBLIC LIBRARIES: GUILDHALL, BATTERSEA, BERMONDSEY, BISHOPSGATE, CAMBERWELL, CHELSEA, CLAPHAM, CROYDON, EDMONTON, HAMMERSMITH, HAMPSTEAD

THE free public libraries in London and its suburbs are of quite recent growth. They usually comprise a central library for each parish, containing reference and lending departments, with reading-rooms for newspapers, and magazines. Many of the larger parishes have, in addition, branch lending libraries and news-rooms, the provision found necessary being, roughly, one library to each 60,000 or 70,000 inhabitants.

The purchase of suitable sites, where ground is so valuable, has been matter of much difficulty, and consequently many of the buildings are not so large or well-arranged as they would have been if greater choice of location had been possible. The libraries described in this and the following chapter comprise examples of successful planning under many difficulties, and may be taken as fairly representative of the whole. Plans are here given of buildings erected upon corner sites, both square and of varying angles; and of others erected upon enclosed sites, where light could be obtained only from the front and back, and in some cases from the roof.

In no instance is the accommodation provided for reference work equal to that found in the largest of the provincial public libraries, nor, probably, is this needed, as the British Museum, with its magnificent stores of books, gives facilities to Londoners which no local library can hope to provide. The best that can be done by them is to provide for the readers the most useful of the ordinary works of reference, which satisfy the needs of three-fourths of the readers, and refer the remainder to other libraries for information upon subjects to which they cannot provide any clue.

In an account of the public libraries of London, that of the Guildhall naturally takes first place, for there was a public library here as early as 1425. It lasted to 1550, when the building was dismantled, and the valuable manuscripts and incunabula scattered. In 1824 it was resolved to re-establish the library, and it was carried on in various unsuitable rooms until 1873, when the present building was opened for public use.

The new library and museum was built from the design of Sir Horace Jones, on a site at the east end of the Guildhall. It has a frontage of 150 feet to Basinghall Street, and a depth of 100 feet. The building consists mainly of two large halls, placed one over the other, with committee room, muniment room, and reading-room for directories, &c., adjoining. The museum occupies the large hall in the basement, and the library is placed above it.

The library is 100 feet in length, 65 feet wide, and 50 feet in height. It is divided into nave and aisles by a series of pillars, and the walls are shelved for bookcases. Double bookcases are also placed at right angles from each pillar to the wall, and form twelve alcoves, a method of construction adopted to facilitate the use of the room as one of a suite of reception rooms when required for civic gatherings. The bookcases are 17 feet in height, and have a gallery round them at a height of 8 feet 6 inches. It is lit by stained glass windows in the clerestory, and two large windows occupying the centre of the north and south end walls of the room. The whole of the fittings, tables, screens, bookcases, and roof are of English oak, and are elaborately carved with the arms of the City Companies and Corporation.

Adjoining the library on the east side is the committee room, which has a richly moulded waggon-headed roof, and is decorated with elaborate carvings. The reading-room is at the south end of the library, and is 50 feet in length by 24 in width. It is lit by a window at the west end, and by skylights in the roof.

The library, a view of the interior of which is given in Fig. 87, is a fine example of the alcove type of library building. It now contains 70,000 volumes and 40,000 pamphlets, and its shelf room is practically exhausted. It seems impossible to obtain adjoining space for extension; but if it is to carry on the noble work it has done in the past, it must have room for growth. The most feasible

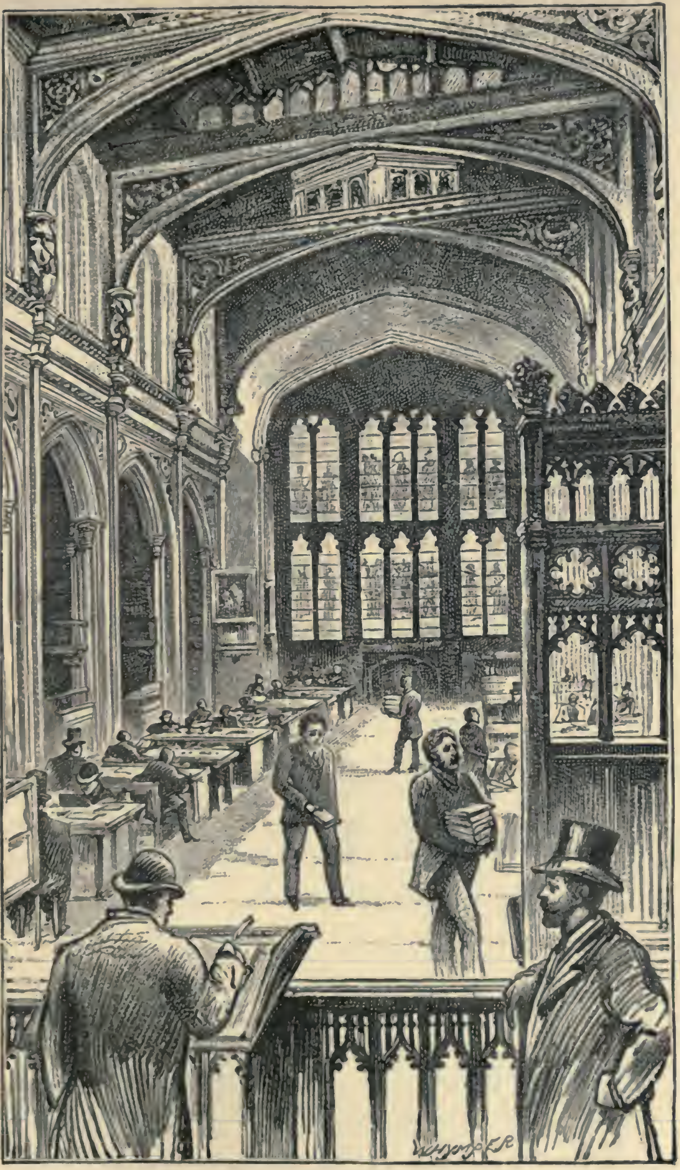


FIG. 87.—Interior view of the Guildhall Library, London.

plan for extending its shelf room seems to be to transfer the museum to other quarters, and to convert it into a book-store. The museum is 83 feet long and 64 feet wide, with a height of 20 feet. It would easily shelve nearly 200,000 volumes, and so provide ample space for the additions for many years.

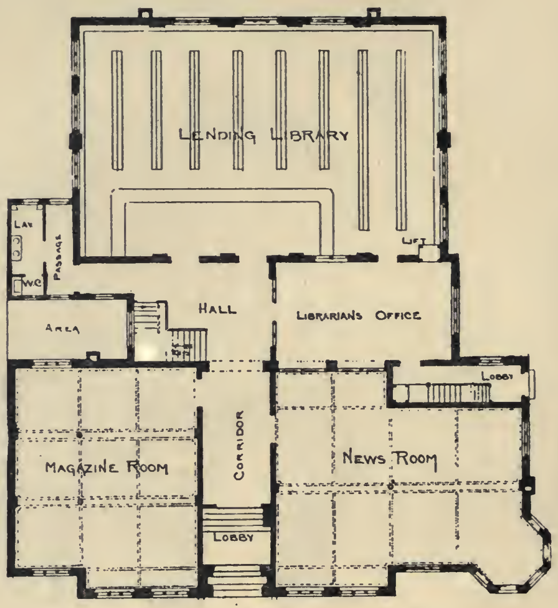


FIG. 88.—Plan of the ground floor of the Battersea Public Library.

The central library for Battersea is situated on Lavender Hill, and was opened in 1890. It was erected from the designs of Mr. E. W. Mountford, at a cost, exclusive of site, of £6600. The site, which cost £3000, is a corner one, and the entrance is centrally placed on the main road (Fig. 88).

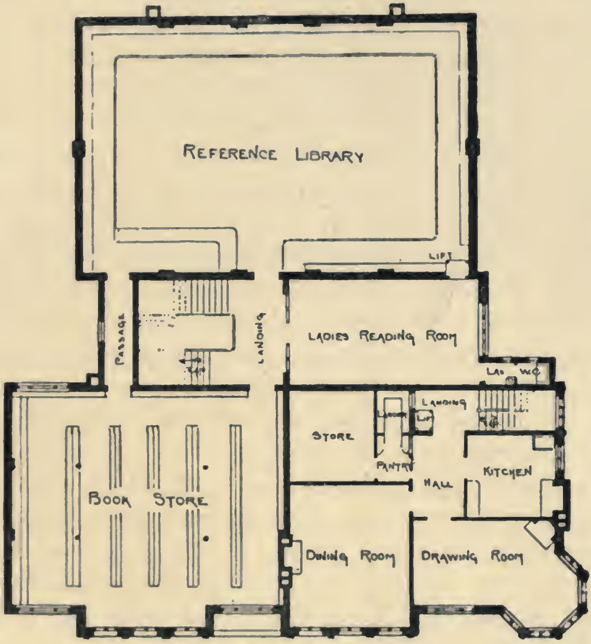


FIG. 89.—Plan of the first floor of the Battersea Public Library.

On the left of the entrance-hall, on the ground floor, is the magazine-room, 890 square feet in area, with seats for forty-eight readers. On the right is the news-room, which is 1000 feet in area, and has reading stands for thirty-four papers, and seats for twenty-eight persons. The librarian's office divides the news-room from the lending library, and the main staircase which faces it adjoins the magazine-room. The lending library is 2000 square feet in area, and extends across the site. It is lit by windows on three sides, and at present is shelved for about 25,000 volumes, in double bookcases 7½ feet in height.

On the first floor (Fig. 89) is the reference library, which extends over the whole area of the lending library beneath. It is entirely lit from the roof, and is shelved for books on all sides to a height of 16 feet, a gallery all round giving access to the upper shelves. In the centre of the room eight tables are placed, with seats for sixty-eight readers. The attendants' desk and counter for card-catalogue are placed close to the door, so that all persons entering or leaving the room are under the close observation of the official in charge.

A ladies' room is placed over the librarian's office, and a book-lift runs from the reference library through the lending library to the basement beneath. The front of the building is occupied by a large book-store, reached by a passage at the back of the staircase, and is shelved to take 20,000 volumes. A residence for the librarian is reached by a staircase at the side of the building, between the librarian's office and the news-room. The second floor contains the upper part of the reference library, with its gallery; a room for committee meetings, the same size as the ladies' room, over which it is placed; and a second book-store, over that upon the first floor. The remainder of the area forms part of the librarian's residence. In the basement is placed a large book-store, covering the whole area under the lending library, and rooms for book-binding, staff, and caretaker.

Although the building was only erected in 1890, experience has shown that it is already too small for the dense population entitled to use it. The library commissioners in purchasing the site were wise enough to buy one larger than they actually needed at first, and an area almost as large as that covered by the present building was left for future additions. Plans are now being prepared for an extension on the ground floor. It is proposed to build at the back of the lending library an annexe 48 feet by 26 feet, and to take away the return of the counter on the left of the entrance shown in Fig. 88, and continue it down to the back wall of the present building, where the first double book-case is now placed. This will give double the existing space for the public in front of the counter, and shelf room for about 25,000 extra volumes in the lending library.

The public library at Bermondsey was designed by Mr. John Johnson, and was opened in 1891. The principal entrance is placed in the centre of the building. On the right is a newspaper reading-room, 41 feet by 33 feet, and at the back of the building, immediately opposite the entrance, is the lending library, 41 feet square, with shelf accommodation for about 25,000.

The reference library is upon the first floor, and is of similar size to the lending department, over which it is placed. It has a domed roof in the centre, supported on columns, and is lit by windows in the clerestory, as well as by others in the side walls. The books are shelved all around the walls, and the tables for readers are placed in the centre. A room for magazines, 41 feet by 24 feet, with a ladies' room, 20 feet by 16 feet, and a committee room, 24 feet by 16 feet, complete the accommodation provided on this floor. A residence for the librarian is provided on the second floor; and in the basement a book-store for about 30,000 volumes, together with the usual rooms for heating, &c.

The Bishopsgate Institute was erected in 1894, from the plans of Mr. C. Harrison Townsend. It provides a lecture-hall, lending library, and reading-rooms for the inhabitants and employees of the eastern portion of the City of London.

A plan of the ground floor of the portion of the building devoted to library purposes is given in Fig. 90. It will be seen that the lending library is in the front of the building, a reference reading-room at the back, and an office for the librarian forming a connecting link between them. On the first floor the whole of this area is devoted to a large reading-room for newspapers and magazines, which seats 130 persons, and also provides reading stands for seventy newspapers. The basement is excavated for a bindery and book-stores, and the total shelf capacity of the building may be estimated at 60,000 volumes. All the public rooms are 15 feet 6 inches in height. The corridors and staircases are lined with glazed tiles. The cost of the building and furniture was £41,000.

The central library at Camberwell was opened in 1893. The whole of the public rooms are on the ground floor, and the entrance is centrally placed, a corridor 10 feet wide and 100 feet in length splitting the building into two equal portions (Fig. 91).

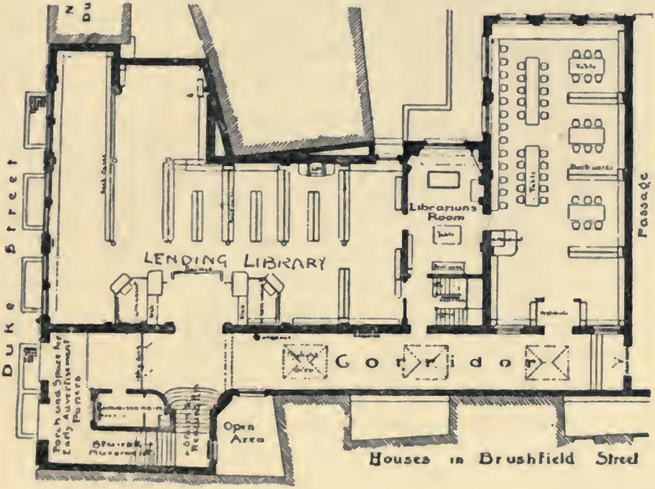


FIG. 90.—Plan of the library portion of the Bishopsgate Institute, London.

On the right hand side of the corridor is the lending department, a room 55 feet by 30 feet, and shelved for about 22,000 volumes. On the left, facing it, is the news-room, of the same size, with accommodation for thirty-eight newspapers on reading stands, and seats for twenty-eight readers at tables. The magazine-room, 40 feet by 30 feet, adjoins, and has doors communicating with both the news-room and the central corridor; it seats forty-eight persons.

On the opposite side of the building, facing the magazine-room, and occupying a similar area, is a board-room and storerooms. The reference library

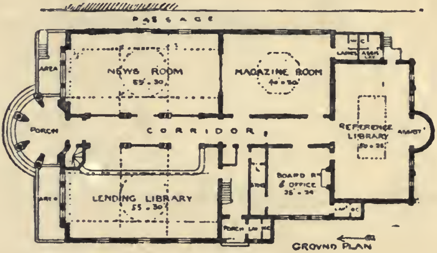


FIG. 91.—Plan of the Camberwell Central Library.

is at the end of the building, the corridor giving admittance to a door at its centre. It is 50 feet by 28 feet, and has an open timber roof. The walls are shelved for books, and tables for fifty-five readers are placed in the centre of the room. The usual rooms for caretaker, heating apparatus, messroom for assistants, &c., are provided in the basement.

The Chelsea central library, designed by Mr. J. M. Brydon, has its entrance in the centre of the front. A short wide corridor leads directly to the rooms on the ground floor, comprising the news-room, the lending library, the ladies' room, and the boys' room.

The principal news-room (Fig. 92), which has an area of 3047 square feet, may be said to be arranged in two main sections; the first, nearest the entrance, for newspapers, is 50 feet 6 inches by 30 feet 6 inches; the second and more retired, for magazines, is 62 feet by 24. It is amply lighted all round, and affords accommodation for 116 readers at the tables and 100 at the newspaper desks, or a total of 216, allowing 14 square feet to each person.

Adjoining the news-room is the lending library, from which the staff can overlook the former at all times. The news-room from its size required that it should be of good height, 17 feet, and it being advisable to keep the floor above on one level, advantage has been taken of this to allow room for the providing of a gallery for books all round the lending library when necessary. The accommodation thus obtained is for 22,230 volumes on the floor of the library, and 7290 volumes in the gallery, or a total of 29,520 volumes. Ample waiting space is also provided for the public, with a counter for indicators and show-cases. The lending library is 1800 square feet in area. Direct access to the book-stores above, including the gallery and the workroom below, is secured by a staff staircase in the centre of the bookcases.

The boys' room, which is 25 feet by 18, is well placed near the entrance, and is arranged to afford complete supervision by the staff in the lending library. The ladies' room, of similar size and shape, but with an annexe 10 feet by 7, occupies the remaining apartment on the ground floor. It will thus be seen that all the rooms to which it is important there should be short and easy access for the public are on the ground floor.

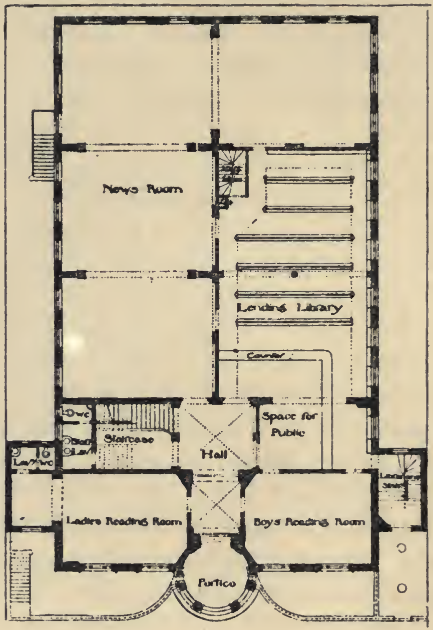


FIG. 92.—Plan of ground floor of the Chelsea Central Library.

A wide well-lighted staircase leads to the reference library (Fig. 93), on the first floor. It is lighted from each end, and by a dome light in the centre. It is 63 feet by 24, and will accommodate seventy-two readers. There are no books at present shelved in the room, but it communicates directly

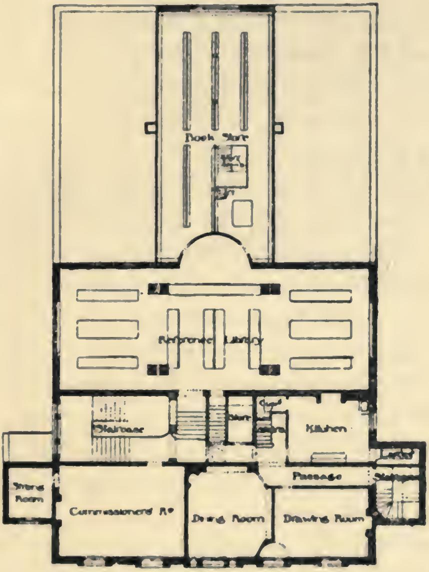


FIG. 93.—Plan of first floor of the Chelsea Central Library.

with the book-stores in the rear, which are 50 feet by 24, and 50 feet by 10.

The commissioners' room and librarian's office is on the first floor, entered from the principal staircase, and has a strong-room attached. A librarian's residence, with separate entrance, is provided on the first and second floors, and there is a spare room on the second floor for newspaper files. In the basement is the storage and the unpacking room, with a separate entrance. The workroom, with staircase to lending library above, the heating chamber, and the caretaker's room, all in the front portion of the building. The premises are lighted entirely by electricity, there being over 200 lights in use: a statement of the annual cost will be found on page 29.

The total cost of the library, inclusive of all furniture and fittings, was £12,966. There is estimated accommodation for books to the number of 100,000, but the present stock is 26,000. The area of the site is 188 feet by 85, and the building is 110 feet 9 inches deep, and has a frontage of 85 feet.

The Clapham Public Library was built in 1889, from the designs of Mr. E. B. I'Anson. The site is about 8000 square feet in area, and the library occupies about three-fourths of it, the remainder being left for extension.

The building is practically one room, supported on brick pillars where necessary, and divided with plain glass partitions for supervision. The entrance is placed at one corner, and admits to the public side of the lending library counter. On the right is the news-room, with reading stands for twenty-five papers, and seats for eighty persons. Adjoining the news-room, at the back of the building, is the reference reading-room, 28 feet by 24 feet, which is overlooked through a glass screen from the librarian's office. The library is shelved for about 25,000 volumes at present, a number which can be materially increased when required. On the first floor, approached by a staircase from the entrance-hall, is a room used for lectures, &c., 45 feet by 24 feet. The remainder of the area is occupied by a residence for the librarian, with a separate entrance from the side. The cost of the building and furniture was £5000, and of the site £1100.

The Clerkenwell Public Library was erected in 1890 on a triangular corner site of some 3000 square feet in area. It is in the English Renaissance style, built of red brick and terra-cotta, the design of Messrs. Kerslake & Mortimer, and consists of three storeys and basement.

The cost of building and furniture was nearly £7000. The lending library is on the ground floor, and is flanked by the news-room. The former has an area of 560 square feet, and the latter of about 900; both rooms are 15 feet in height. The shelving capacity of the lending library is 11,000 volumes.

This library is somewhat noteworthy as being the first of the British free libraries to open its lending department to the borrowers, and to allow them to choose their own books. The public enter the library at one side of an enclosed counter in which an assistant is placed, and leave with him the books they are returning. After choosing a volume from the open shelves they bring it to the other side of the counter, where it is booked to them, and they then leave the library by a different door from the one by which they entered. The bookshelves are placed end on with the issue counter, so that an assistant stationed there cansee between each, and has full control of the whole library.

The site is small, and consequently the library is very much cramped and crowded. On the first floor is the reading-room for magazines and reference library, the former with an area of about 1400 square feet, and the latter of 560, with shelf room for about 10,000 volumes. The second floor contains staff room, librarian's office, and committee room. A basement extends under the whole building, and can be shelved for books when needed; it will hold about 50,000 volumes. The total shelving now provided is for 29,000 volumes.

The Croydon Central Library forms part of the new Municipal Buildings, and was designed by Mr. C. Henman. It was opened, on 19th May 1896, by their Royal Highnesses the Prince and Princess of Wales.

The library forms a continuation of the corporation offices, but is recessed 45 feet from the face of the former, the entrance being in the angle so formed, immediately under a clock tower. On entering, a short double flight of steps, with marble balustrade, leads to a hall 20 feet square, and lighted from the top. Here is the office of the chief librarian, with glazed sides, placed so as to command the "Braithwaite" Hall, lending library, and entrance-hall.

At the right hand side is the "Braithwaite" Hall, which is used as a reference library and magazine-room; it is 64 feet long by 36 feet wide, and 43 feet high. The walls are faced with Ancaster stone, and it has a panelled dado of oak 8 feet high; the fittings and the fine open timber hammer-beamed roof are also of oak. Below the windows runs a continuous band of stone, divided into five panels sculptured to illustrate the philanthropic aims of the late Rev. J. M. Braithwaite, vicar of Croydon. Dying suddenly in the midst of his beneficial labours, a committee was formed to provide a suitable memorial, and they handed over to the council the sum of £2000, on condition that it should be expended on permanent decorations to the principal room of the library, and that it should be called the "Braithwaite" Hall.

Along the south side is a gallery with open arcaded balustrade, in which is a range of book-cases containing the reference library. At the west end are three windows, containing figures in stained glass representing the "Aims of Knowledge"; Religion is in the centre, with Science and Art on either side. At the east end the three corresponding windows have heads in medallion, representing the "Means of Knowledge"; Thought in the centre, with Reading and Writing at each side. The five windows along the north front also contain heads in medallion, with symbolical representation of the "Branches of Knowledge"; Geography, Natural Science, History, Law, Philosophy, Theology, Mathematics, Physics, Medicine, and

Chemistry. The cartoons for these and other stained glass in the buildings were drawn by Mr. H. Walter Lonsdale.

The room is furnished with eight 8-feet tables of fumigated oak, having a ridge down the centre of each to hold the nameplates of the various magazines, which are fastened to the tables; a similar table, but without the ridge, is placed opposite a "Cotgreave" Periodical Rack, fixed to the wall. At the west end of the room are three tables, each 7 feet in length, reserved for readers of reference books. These are divided from the other portion of the room by an ornamental balustrade, similar to the one in the gallery. There is seating accommodation for 100 persons. The room is lit by electricity; from the hammer beams of the roof hang pendent electroliers of wrought iron and copper, each holding ten lamps. The flooring is of teak blocks laid solid on concrete.

Below the "Braithwaite" Hall is the news-room, 64 feet by 22 feet, fitted up with stands to accommodate fifty newspapers. Parallel with this room, and communicating with the hall above by a circular staircase, which also goes up to the gallery, is the book-store, of the same length, but only 13 feet wide, for the storing of books and newspapers. At the end of the news-room is a second room, 38 feet by 24 feet, used at present as a storeroom for files of newspapers, &c., but which can be used as an additional reading-room should occasion require.

On the left side of the entrance-hall is the lending library, 52 feet by 35 feet, containing eight isolated double bookcases, four being 16 feet long and four 13 feet long and 8 feet high, having a step

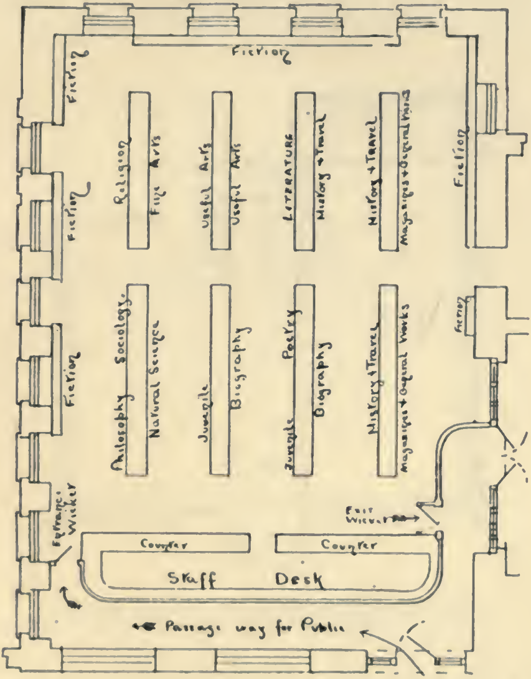


FIG. 94. Plan of the lending department, Central Library, Croydon.

9 inches from the bottom. Around the walls are cases for fiction. Shelving accommodation has been provided for 25,000 volumes. The library is

arranged to suit the "Open Access" system, which is in operation here.

At the north end is the staff counter, of oval shape, 28 feet long (Fig. 94), with a wicket gate on either side, fitted with springs and Lambert's patent latches. The method of working is as follows :—Borrowers returning books go to the east end of the counter, hand their books to an assistant, who, if all is correct, gives them their reader's ticket, releases the gate, and allows them to enter. After having selected a book the readers go to the other end of the counter, and

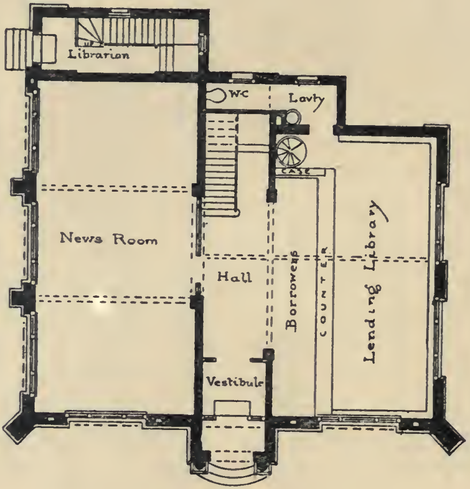


FIG. 95.—Ground plan of the Edmonton Library.

the assistant there stamps the books with the date of issue, and allows them to leave by the second gate.

A good example of a well-arranged building for a small library on two floors is seen in the "Passmore Edwards" Library at Edmonton, designed by Mr. Maurice B. Adams. Reference to Fig. 95 will show that the entrance-hall is placed in the centre and runs from the front to the back of the building, where the staircase to the first floor is planned.

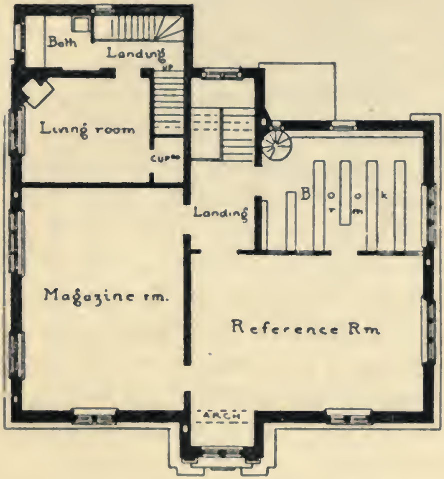


FIG. 96.—Plan of the first floor, Edmonton Library.

The news-room is on the left of the hall, and is entered by a door placed opposite to the issue desk of the lending library, which is on the right, and has a counter for borrowers running across it. On the first floor a magazine-room is planned over part of the news-room (Fig. 96), and a reference room and book-store cover the entrance-hall and lending library. A circular staircase runs from behind the counter of the lending department to the book-store above. The librarian lives upon the premises, and a separate entrance is provided for him at the end of the news-room, with one room upon the first floor adjoining the magazine-room, and others upon the second floor.

A small library, planned in two storeys like this, is more costly to administrate than if all departments were on one floor and capable of being supervised from one centre, as in the Hammersmith Library, designed by the same architect. Where it is impossible to obtain room for a one storey building, a plan similar to this will be found to work well, for it has a cheerful feeling of roominess about it, and there is ample light for each department.

Another of the libraries founded by Mr. Passmore Edwards is the Hammersmith Public Library at Shepherd's Bush. The special feature aimed at by the architect, Mr. Maurice B. Adams, in this building is supervision of all departments from the counter of the lending library. To insure this the several public rooms are divided by glazed screens, which permit a view of them all without inconvenience to the readers or officials in charge.

The exterior (Fig. 97) is designed in the

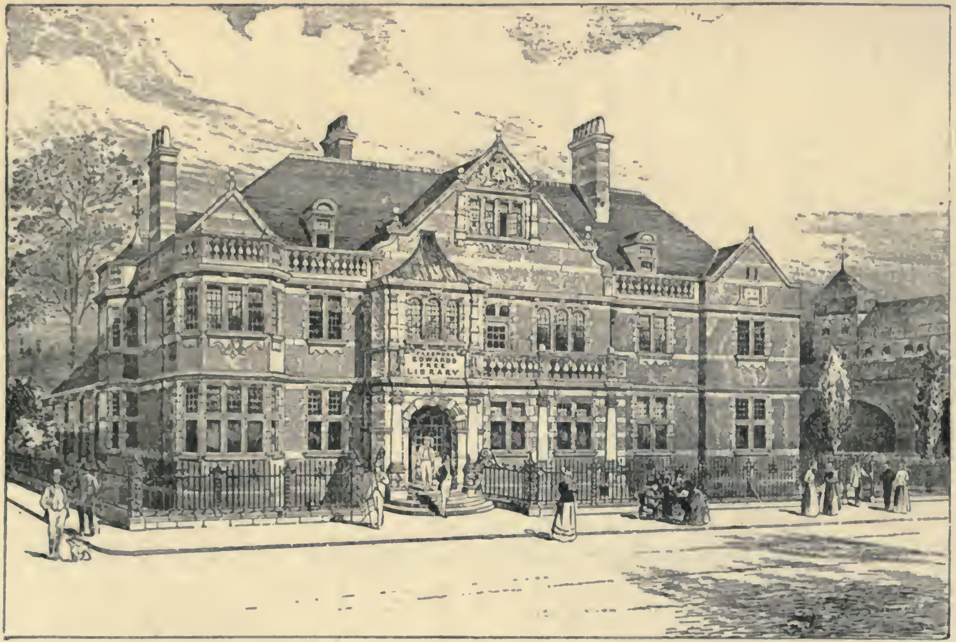


FIG. 97.—The "Passmore Edwards" Public Library, Hammersmith.

English Renaissance style, with bold cornices and handsome mullioned windows, an interest being obtained with widely proportioned bay windows the whole height of the façade, which is finished by gables and dormers picturesquely breaking the skyline, and grouping with the tall brick and stone chimneys.

The public rooms are ample and commodious. They comprise a central hall for the lending department, 30 feet by 24; news-room, 50 feet by 25; magazine-room, 20 feet by 18; ladies' room, 20 feet by 12; boys' room, 25 feet by 12; reference room, 30 feet by 17; and a lending library, 40 feet by 22, capable of storing about 30,000 volumes. The counter is 30 feet long, with ample room for service in the rear; there is also a show-case at one end, 6 feet wide, for the display of new books. The arrangement of the rooms is shown in Fig. 98.

Reading slopes, 5 feet 6 inches high, for daily newspapers have been placed against the walls of the news-room, and four double slopes, 15 feet long, stand on the floor; most of the weekly papers are fixed on these, and a title board is placed over each.

The ladies' room is provided with two slopes placed against the wall at a height of 3 feet 6 inches, thus enabling the readers to be seated while using them. The tables in the magazine-room have a division down the centre, on which the title boards are fixed, the reading cases being fastened by cords to the tables. The top floor of the building is used as a book-store, and is connected by a lift.

The library was the gift of Mr. Passmore Edwards, and cost £6400 for building, furniture, and wiring for electric light.

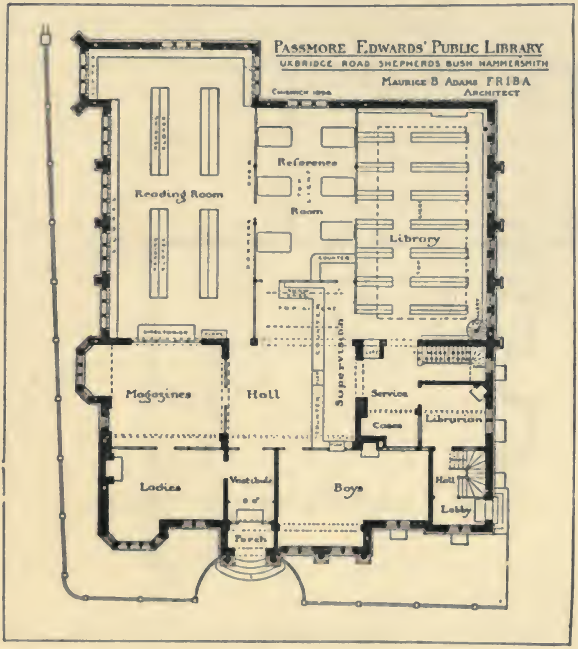


Fig. 98.—Plan of the Passmore Edwards Library, Hammersmith.

The Hampstead Library is one of the latest additions to the ring of libraries which is rapidly encircling London. It is now in course of erection, and will soon be ready for occupation. The site is a corner one, with a frontage to one road of 120 feet, and to another of 156 feet.

The present building, of which we give a plan

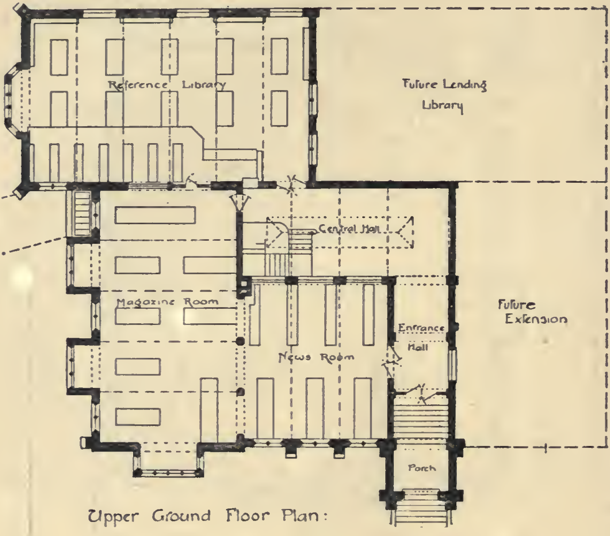


FIG. 99.—Plan of the Hampstead Central Public Library.

(Fig. 99), covers only a portion of the site, the remainder being kept for future extension. The main entrance is planned on the longest side, and gives immediate access from the hall to the news-room, 26 feet by 28 feet, which opens into a magazine-room, 46 feet by 25 feet. The reference library, which is 50 by 30 feet, is reached from the central hall, and stairs lead down to a well-lit room in the basement of the same size, at present to be used for the lending library, but in the future as a storeroom for reference books.

The architect, Mr. Arnold S. Tayler, estimates the cost of the building without furniture at £5000, and the contract for building has been let on those terms.

CHAPTER X

LONDON LIBRARIES (*continued*): LAMBETH, POPLAR, ST. GEORGE'S (HANOVER SQUARE), ST. MARTIN-IN-THE-FIELDS, STREATHAM, WEST HAM, WESTMINSTER

THE central library for Lambeth is situated at Brixton, and is called, after its donor, the "Tate" Central Library. It is built on a corner site on the main road, but well set back from the din and noise of the ceaseless traffic. The area of the site is 10,000 square feet; the main frontage is 95 feet, and the depth 105 feet.

The entrance is planned in the centre of the shorter side, and gives access to a magazine-room, 35 feet by 28, on the left hand, and a newspaper-room, 45 feet by 35, on the right. The lending library is at the back of the building, and its doors face the entrance (Fig. 100). It is 46 feet by 37, and has a counter 65 feet long, with returns running across it, on which are placed four blocks of Cotgreave's indicators for 21,000 volumes. A staircase leads from the entrance-hall to the reference library upon the first floor. The books are shelved in a book-store covering the lending department beneath, and the whole of the front of the building is occupied by the reference reading-room. This is 85 feet by 28, and is at present furnished with ten tables, at each of which ten readers can be seated. Three tables are screened off at one end to form a ladies' reading-room, and one is reserved for writing purposes. The room is well lit by ten large side windows, and is 20 feet in height. Between the reference reading-room and the book-store is the librarian's room, 22 feet by 16, which is also used as a committee room (Fig 101). The total public accommodation provided in the building is fifty seats at five tables in the magazine-room, thirty seats at three tables in the reading-room, and stands for the display of forty papers in the newspaper-room, and one hundred seats at ten tables in the reference library. None of the rooms are seated to their fullest extent, and seats for fifty more readers could easily be found. The lending library is shelved at present for 25,000 volumes, and the book-store of the reference library, which is 18 feet in height, is intended to take two storeys of shelving, but the walls are thick enough to allow the roof to be lifted for a third. The book-store is lit by a large skylight, and is fitted with double bookcases in the centre of the room, and single cases against the walls. Those in the centre are 18 inches from back to front, and 8 feet in height, with a length of 36 feet, divided into nine divisions of 34 inches each. In these the ordinary octavos are shelved, larger books being placed in the specially wide cases placed against the wall.

In the basement are large rooms, which can also be used for book-stores when necessary. The total shelf accommodation of the whole building is about 150,000 volumes. An outside stair leads to the basement for the unpacking of boxes, &c., and a circular staircase and lift are provided, running up through the lending library to the book-store on the first floor.

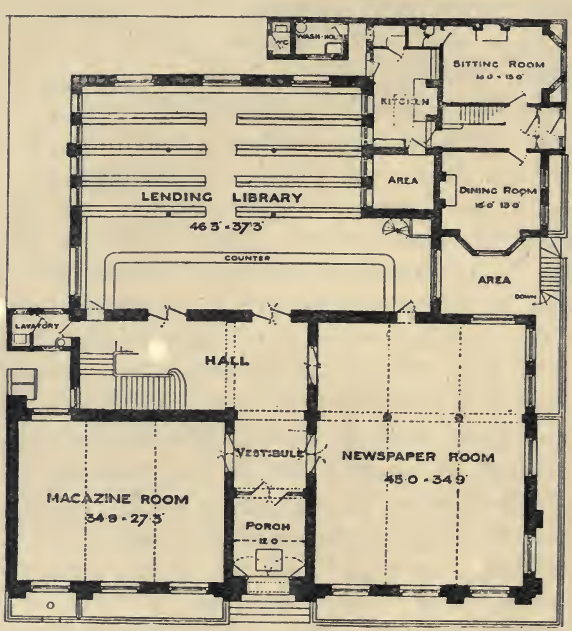


FIG. 100.—Plan of the ground floor of the "Tate" Central Library, Brixton.

A residence for the librarian is placed at one corner of the building. Reference to plans 100 and 101 will show the disposition of the rooms upon the ground and first floors.

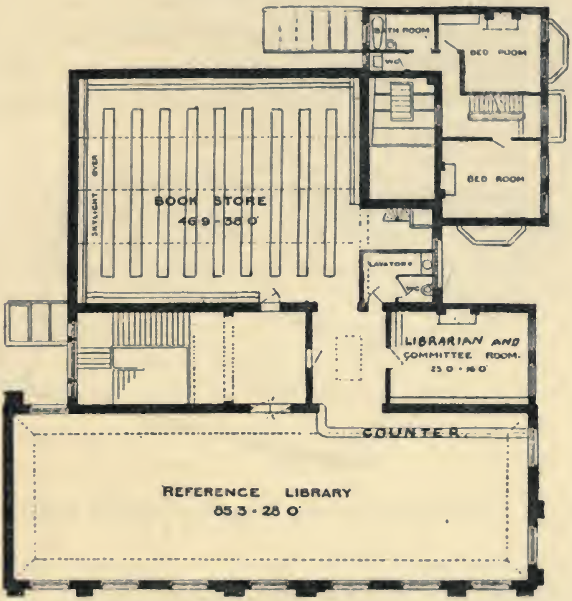


FIG. 101.—Plan of the first floor of the "Tate" Central Library, Brixton.

The library was opened in 1893, and four years' experience has proved that it is well adapted for the work to be done in it. The space for the public in the lending department is small, and inconvenience is felt during the evening rush on the busiest days, when the issue reaches about 1700 volumes. The building was erected from the designs of Mr. Sidney R. J. Smith, and cost, with the site, £16,400. The whole expense was defrayed by Mr. Henry Tate of Streatham.

In Fig. 102 is shown the plan of the South Lambeth Branch Library, also designed by Mr. Smith, and built at Mr. Tate's expense. It is introduced here as a good example of the judicious treatment of a somewhat difficult site. It is a branch library, comprising only reading-rooms and lending library, and is situated at the corner of two intersecting streets. The whole of the public rooms are on the ground floor, with a residence for the librarian over the front portion. The entrance is fixed at the corner of the site, and the lending library and news-room are placed parallel to each other, the latter being kept square,

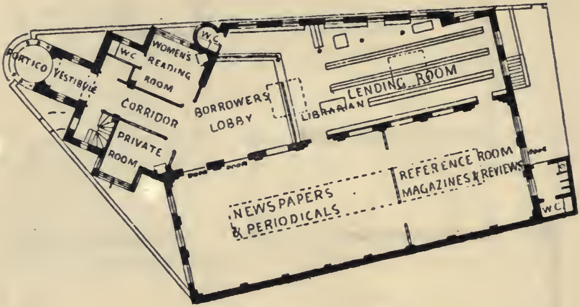


FIG. 102.—Plan of the "Tate" Branch Library, South Lambeth.

while the irregularity of the site is masked by the bookcases in the former.

The news-room is 75 feet by 28, and its chief light is obtained from the roof. Ten newspaper reading stands are placed against the walls, and hold thirty papers. A double row of eleven tables are in the centre of the room, and seat ninety persons. On either side of the entrance-hall are two small rooms, one for ladies and the other for the librarian. The lending library is shelved for about 20,000 volumes, and can be extended by raising the roof and introducing another storey.

The cost of the building and the site was about £6000.

In Fig. 103 is given the plan of the North Lambeth Branch Library, built in 1894. It is erected upon an irregular corner site, with a frontage of only 34 feet, and a depth of 150. The building is one storey in height, except the front portion, which is three, and in which is placed a residence for the librarian. The large newspaper-room is at the back of the building. It is 65 feet deep, and has an average width of 60 feet. In it are nineteen reading stands, on which are placed sixty-five papers and periodicals. In the centre of the room are seven tables, which seat seventy-four persons. The room is divided by two rows of iron pillars into nave and aisles, and is lit by large windows of plate glass in the clerestory and on one side. The magazine-room is in the front of the building; it is 31 feet by 21 feet 6 inches, and seats fifty persons at four tables. The lending library occupies a space between the magazine- and newspaper-rooms; it is 48 feet long, and has an average depth of nearly

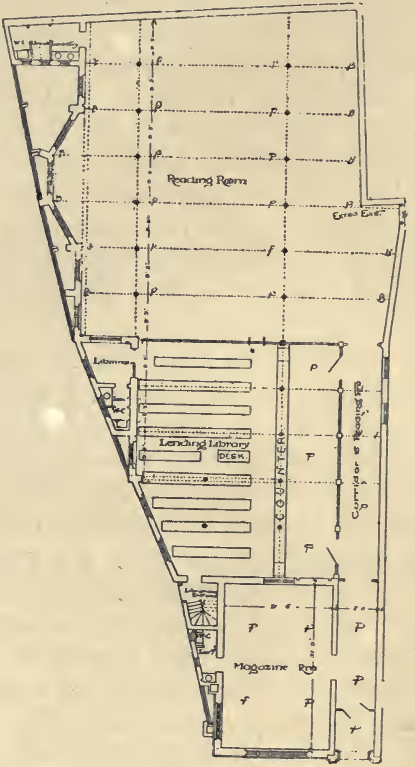


FIG. 103.—Plan of the North Lambeth Library.

40 feet. It is shelved for 15,000 volumes, and the room is high enough to allow a second tier of

bookcases to be placed upon those now *in situ*. Complete supervision is obtained of both the public rooms from this point, as the divisions between are pitch-pine screens fitted with clear glass.

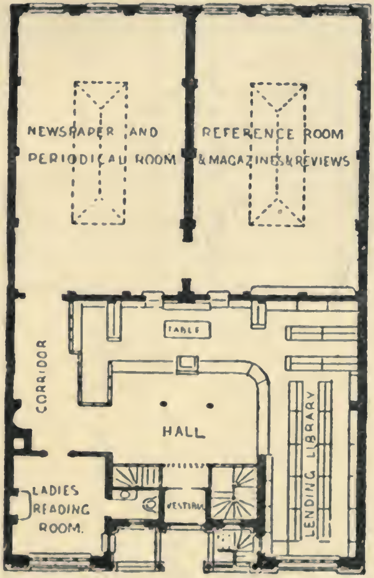

NEWSPAPER AND PERIODICAL ROOM
REFERENCE ROOM & MAGAZINES & REVIEWS
TABLE
CORRIDOR
HALL
LENDING LIBRARY
LADIES READING ROOM.
VESTIBULE

FIG. 104.—Plan of the West Norwood Branch Library.

The branch library at West Norwood occupies a site 80 feet by 50. It will be seen from Fig. 104 that the building is divided into two halves, the front portion containing the lending library and reading-room for women, while the back portion is divided into two rooms, for newspapers and magazines. The plan is simple, and allows good supervision of each room and the entrance from the issue desk.

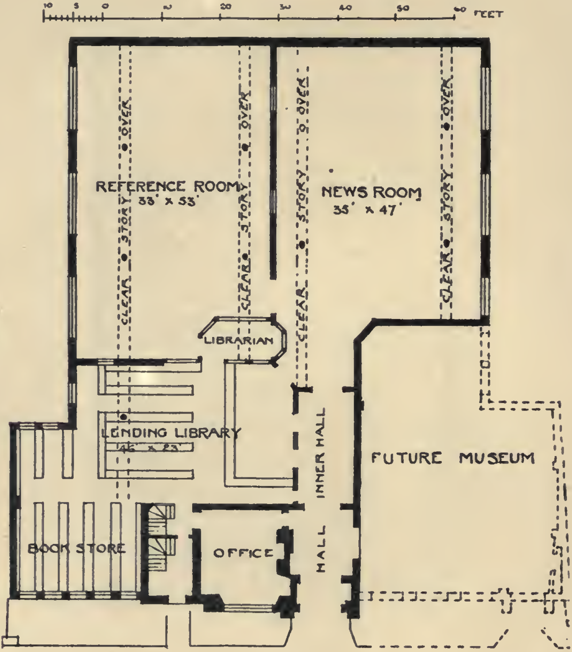


FIG. 105.—Ground plan of the Poplar Public Library.

The building was erected in 1888, from the designs of Mr. Sidney R. J. Smith, and cost £4000.

The Poplar Public Library was erected in 1896, from the designs of Messrs. Clarkson. The general arrangement will be seen from the accompanying plan (Fig 105). The central block is 45 feet in height, and contains entrances, committee room, office, room for staff, &c. A residence for the librarian is provided on the first and second floors, cut off from the rest of the building by walls and fireproof divisions, but with an iron door for communication. The buildings on the east of the central block are 20 feet in height.

The public entrance is through a vaulted hall, 11 feet 6 inches wide, from which the office is reached. The lending library, which will shelve 40,000 volumes, is placed as near as possible to the street, so that those coming for books need not disturb the readers. The staff are able from the lending library to overlook the whole of the public portions of the building.

The news-room and reference room are each 22 feet 6 inches in height in their central portions. The lighting in each room is obtained from side windows, aided by others placed in a clerestory well within the side walls. The form of the site permitted perfect lighting of every portion of the building, and the architects have made the most of their opportunity.

The St. George's, Hanover Square, Library has been erected from the plans of Mr. Albert J. Bolton. The main features are the placing of all the principal rooms on the ground floor, the avoidance of unnecessary steps and corridors, easy means of intercommunication between the news-rooms, reference library, and lending library.

The façade is of free English Renaissance character, simple in outline and detail. The principal entrance leads through a vestibule, with inner screen-doors to the hall, 18 feet wide, in which is placed the main staircase. This hall and staircase, forming one of the chief features of the building, lead to the natural history museum and the board room, on the first floor.

On the ground floor, immediately on the right hand when entering, is the lending library, a room 64 feet long by 31 feet wide (Fig. 106). As in most of the other rooms, a portion of the light is obtained from the top by means of a large lantern light formed in a covered ceiling. The room is filled with double-sided bookcases, 9 feet in height, in addition to the shelving placed round the walls, and will accommodate about 20,000 volumes.

The reference library is situated in the rear of the building. It is a room 36 feet by 39 feet, and 20 feet high. In addition to two side windows, it has a central dome lantern light of ornamental tinted lead glazing, 17 feet in diameter, the lower portion having a deep panelled frieze. From the upper portion of this lantern, ventilation is obtained. Bookcases have been erected on three sides, with a gallery running round, reached by a spiral staircase, which is also carried down to the book-store in the basement; in addition, a book-lift is provided near the attendants' counter. At the end of the room, under the windows, two alcoves are formed by a projecting, double-sided bookcase, readers' tables being placed in each bay.

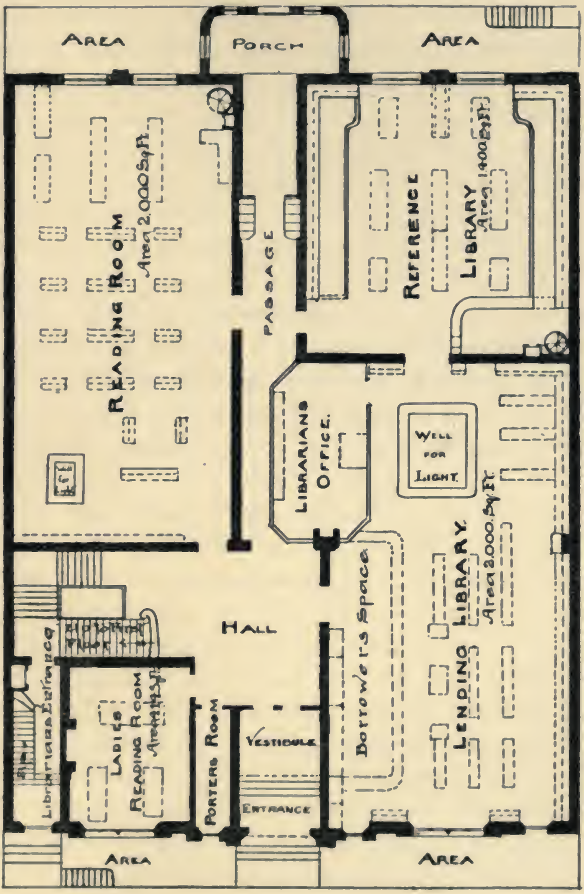


FIG. 106.—Ground plan of the St. George's, Hanover Square, Public Library.

The reading-room, placed at the back of the building on the left of the main hall, is 32 feet wide, 63 feet in length, and 26 feet high, and lighted principally from the roof. Stands for newspapers are placed in the front part of the room, and tables at the far end for readers of periodicals. A separate reading-room for ladies has been provided; it is in front of the building, and is reached from the main hall on the left hand, immediately on entering.

The librarian's office is in the centre of the building, with the various departments grouped around. The whole of the basement is excavated, and ample storage for books provided therein; as well as caretaker's rooms, heating apparatus, fuel, &c.

On the first floor have been located a natural history collection and board room; the former is arranged in a large and handsome room, well lighted both from the front and back. The second floor forms a residence for the librarian, with a separate entrance and staircase. The whole building is of fireproof construction, the floors formed with rolled iron joists encased in coke breeze concrete. Fire hydrants have been provided on the main staircase, corridors, and entrance-halls. The heating is by a low-pressure system of hot water; and ventilation is obtained by means of fresh air inlet gratings through the outer walls, and carried by troughs placed along the side walls next the ceilings of the basement, to supply the vertical shafts formed in the recesses. The removal of vitiated air is effected by means of a trough along the apex of the roof, and extracted from the same by Boyle's air-pump ventilators. The interior fittings and furniture are in dark polished oak, in thorough keeping with the general character of the building. The cost of building, furniture, and site was about £15,500.

The St. Martin-in-the-Fields, and St. Paul, Covent Garden, Public Library is situated in St. Martin's Lane, and has a frontage of 67 feet. It consists of three main rooms, all the same size, and situated one over the other, the entrance-hall and staircase being at the side.

The reference library, which is 50 feet in length and 40 feet broad, with a height of 14 feet 3 inches, has shelf accommodation for 15,000 volumes. The principal feature of its arrangement is that readers have free access to the entire library, the books being arranged in alcoves and wall-cases.

The lending library and magazine-room is directly underneath the reference library, and has a height of 15 feet 9 inches, with shelf accommodation for 15,000 volumes. The periodicals are arranged alphabetically on tables in the centre of the room, and have signboards with their names attached to each table. One noticeable piece of furniture is a cylindrical catalogue, the invention of the librarian, for showing the titles of the books added. New titles can be inserted as added, and the whole of the titles can be revolved in front of the reader.

The news-room is partly in the basement, and is 14 feet in height. Everything in this room is fixed to reading stands or tables, including the directories. In addition to the usual daily papers, it contains sixty-four weeklies of about the size of the *Saturday Review*, arranged on stands in alphabetical order. The total cost of the building and fittings was about £7500.

The "Tate" Public Library, Streatham, was built in 1891, from the designs of Mr. Sidney R. J. Smith. It is a good example of a compact building for a small library on one floor. All the rooms are well arranged for supervision, and there is no waste of space in long corridors and entrance-halls.

The entrance is in the centre of the main frontage, and on the left is a newspaper-room, 40 feet by 25 feet, and 22 feet in height. This accommodates thirty readers at three tables, and twenty-five newspapers upon reading stands. On the right is a magazine-room, 30 feet by 25 feet, and 16 feet high, which seats fifty readers. The lending library, 47 feet by 29 feet, is at the back of the building, with the issue desk placed in a counter opposite the entrance-door. The books are arranged in double book-cases, placed at right angles to the wall, and will shelve about 25,000 volumes. Adjoining the lending library and magazine-room, with a door into each, is the librarian's office and committee room, 20 feet by 18 feet. A residence for the librarian is provided over part of the building, and is approached by a staircase at the back of the committee room. The general arrangement is shown in Fig. 107.

The style of the building is essentially Greek in feeling. It is faced with Portland stone, and the entrance-doors are of oak, with bronze pateræ and other enrichments. The floors of the entrance-hall and public portions of the lending library are of black and white tiles, with interlacing Greek key patterns. The arched ceiling of the newspaper room is of fibrous plaster, and has panelled soffits, with Greek honeysuckle ornament in the spandrils and the upper portions of the windows, and transomes over the doors are filled with green tinted glass, bearing the same ornament in brown tints.

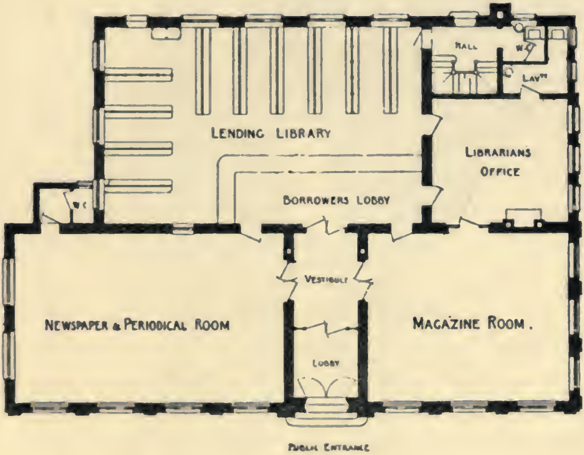


FIG. 107.—Plan of the "Tate" Public Library, Streatham.

The cost of the building and site was about £8000, and was wholly defrayed by the donor, Mr. Henry Tate of Streatham, after whom the library is named.

The West Ham Central Library forms the north-west corner of the West Ham Technical Institute (Fig. 108), and occupies an area of about 115 feet

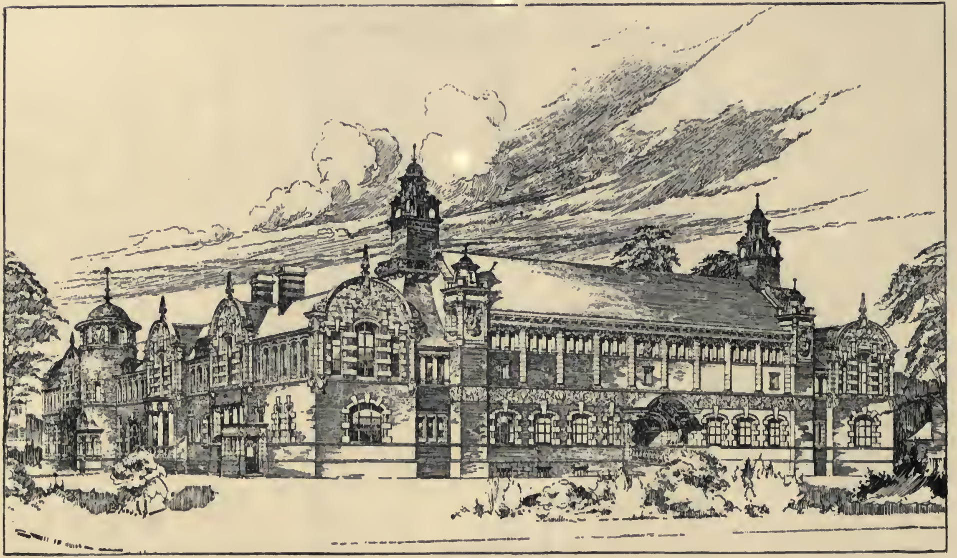


FIG. 108.—Technical Institute and Library, West Ham.

by 110 feet, entirely cut off and separate from the remainder of the building.

The entrance-hall is placed centrally, and gives access on the right to the newspaper and magazine reading-room (Fig. 109), and on the left to the public part of the lending library, which also serves as a passage to the reference library behind. The news-room is 110 feet by 33 feet, and is lit by windows at both ends and by a large skylight in the centre. It is divided into three portions by double columns, and is under the supervision of an attendant stationed in a small room at the end of the entrance-hall. It is planned to seat one hundred persons at ten tables, and to provide reading stands for about eighty newspapers. A file-room is handily placed at the back of the attendant's room, in which are kept recent numbers of the daily and weekly newspapers.

The lending library, on the left of the entrance-hall, has a book-store, 67 feet by 37 feet, in which the books are arranged in double cases at right angles to the windows. The public space is 60 feet by 20 feet, and is separated from the book-store by a counter 60 feet long. Opening out of the lending library is the reference library, a room 35 feet square, lit from an area on one side, and also by a skylight in the domed roof. The counter is at the corner nearest the lending library, and the books are stored at the end of the lending department book-store. It is planned to seat eighty persons at ten tables. Parallel with the reference library, which is, as will be seen from Fig. 109, in the centre of the building, is the librarian's office, with a strong room opening from it for rare books, and a small storeroom for a collection of local literature and antiquities.

The whole of the rooms are 18 feet in height,

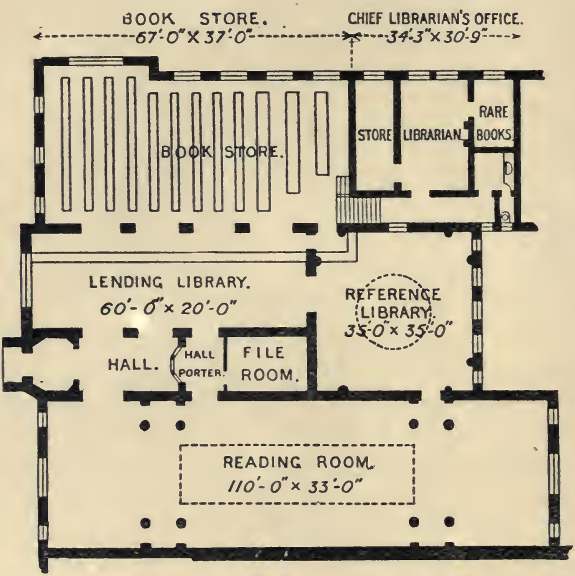


Fig. 109.—Ground plan of the West Ham Central Library.

and the lending library book-store can have two tiers of bookcases, each 7 feet 6 inches in height, thus giving shelf-room for about 60,000 volumes. In the basement underneath, further accommodation can be obtained when the whole of the shelving is full.

The building is being erected from the designs of Messrs. Gibson & Russell, and it is expected that it will be ready for occupation in 1897.

The new building for the public libraries of the united parishes of St. Margaret and St. John, Westminster, was opened in 1893. It was designed by Mr. F. J. Smith, and cost nearly £7,400.

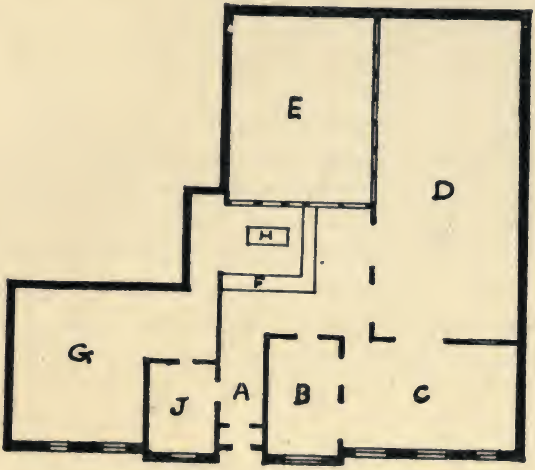


FIG. 110.—Plan of the Westminster Public Library.

A. Entrance.
B. Women's reading-room.
C. Ratepayers' reading-room.
D. General reading-room.
E. Reference library.
F. Issue counter.
G. Book-store.
H. Attendant.
J. Librarian's office.

The principal entrance is in the centre of the building, with a private entrance at the southern end, giving access to the board room and the librarian's apartments (Fig 110). Within the central entrance is a vestibule leading to the issue department, that being so placed that there is easy control over the whole of the public rooms.

The reference reading-room, which is 36 feet by 25½ feet, is at the rear of the counter, and adjoins the newspaper-room, 60 feet by 25½ feet, both being top lighted. The ratepayers' reading-room, 31 feet by 19 feet, and ladies' reading-room, 20½ feet by 13 feet, occupy the front portion of the building at the northern side; on the southern side of the principal entrance are the librarian's office and book-store. The basement is occupied by another large book-store and housekeeper's rooms, &c. On the first floor is the board room and the librarian's apartments, and on the second floor, a storeroom for papers, &c. The heating is by means of steam radiators. Electric lighting has been adopted throughout the building.

CHAPTER II

AMERICAN LIBRARIES: BOSTON, LIBRARY OF CONGRESS (WASHINGTON), NEW YORK MERCANTILE LIBRARY

THE Boston Public Library is now housed in a new building, which was opened to the public in 1895. From the architectural and artistic point of view it is probably the most beautiful building in America; but unfortunately, in many respects, the useful has been sacrificed to the ornamental, and so it does not entirely fulfil the ideal of a great public library.

It occupies one side of the chief square in the city, and has a street frontage on three of its sides, the fourth overlooking the yard of the Harvard Medical School. The building was designed by Mr. Charles F. M'Kim, of the firm of M'Kim, Mead, and White. Its façade may be said to be founded upon the model of that of the Bibliothèque Ste. Geneviève, in Paris; but although it is of the same type, the proportions and details are different, and the interior arrangements and plan have nothing in common.

The building is nearly square; it is 225 feet long and 227 feet deep, its height from the ground to the top of the cornice being 70 feet. The material used in the façade and two sides is a greyish-white granite, sprinkled with a delicate pink. The rear wall, overlooking the Medical School, is of brick. The front, looking over Copley Square, is two storeys in height, the lower being of rusticated masonry, with conspicuous joints, the upper arcaded with thirteen window arches (Fig. 111). Above is a rich cornice and a purple-tiled roof. The building rests upon a broad granite platform, forming a side walk, with low posts at intervals along the edge. It extends entirely round the three street sides, and is six steps high in front of the main entrance.

The entrance is in the centre, by three arched doorways, to be flanked on either side by bronze statuary now being designed by Mr. A. St. Gaudens. Each arch is fitted with wrought iron gates, and appropriately above the centre one is the inscription "Free to All."

A similar row of arcaded arches to that in the front is extended along the Boylston Street frontage, and half-way along the Blagden Street façade. There are thirty of these great window arches, all alike in general effect and ornamentation. The central three on the front side contain below the windows sculptured panels, with the seals of the Library, City, and State. Similar panels in the remaining twenty-seven are filled with memorial tablets containing the names of great authors, statesmen, artists, scientists, and soldiers. In the spandrils of each window-arch is a series of medallions, thirty-three in all, on which the printers'-marks or trade-devices of celebrated printers and booksellers have

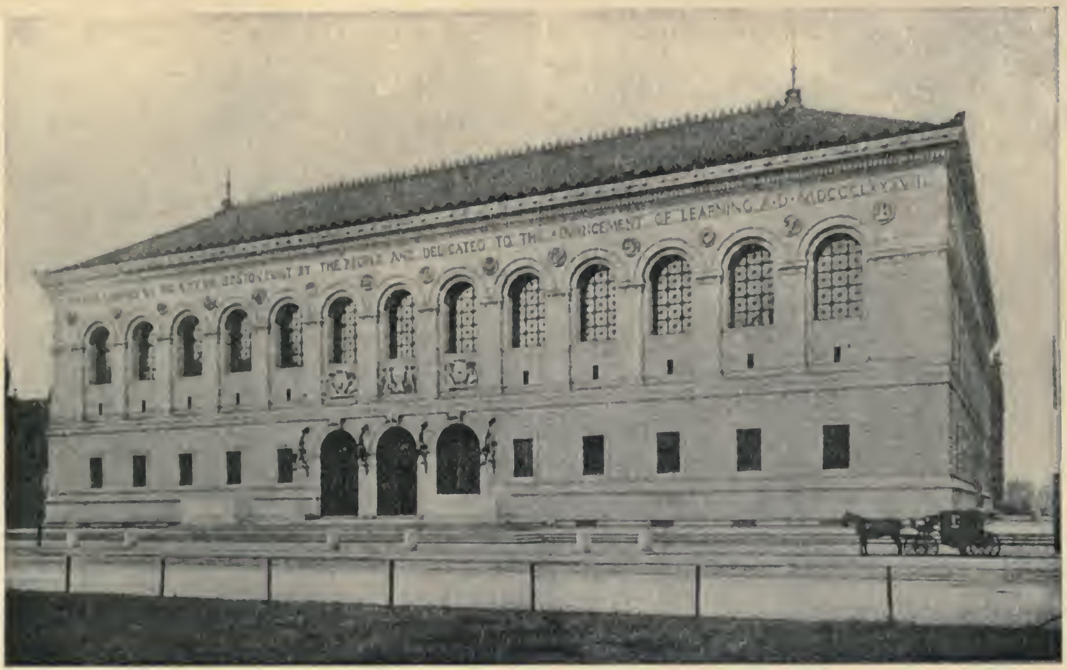


FIG. 111.—The new Public Library, Boston, Mass.

been sculptured by Mr. D. Mora. These form a most interesting memorial of the early printers, the only modern one being that of the Riverside Press of Cambridge.

Above the arcade is a narrow frieze, bearing on each façade an inscription. That on the front of the building is "The Public Library of the City of Boston. Built by the People, and Dedicated to the Advancement of Learning, A.D. MDCCCLXXXVIII." A noble cornice enriches and crowns the building. It is ornamented with a row of lions' heads, and topped by a copper cresting, coloured an antique green. A similar copper cresting crowns the sky-line of the roof, and terminates at the corners of the building in metal masts.

In the centre of the Boylston Street side is the entrance to the administration offices of the library. While not so elaborate as the main entrance, it is still very fine. It has three arches, the centre one giving admittance for vehicles.

The main entrance on Copley Square leads into a vestibule, and thence by three doorways into the entrance-hall, the whole being executed in pink marble. The doorways are copied from those of the Temple of Erechtheus on the Acropolis of Athens, and are to be closed with bronze doors, now being designed by Mr. D. C. French.

The entrance-hall leads to the grand staircase and two elevators which give access to the main rooms of the library on the first floor. On either side are short corridors, 10 feet wide, leading to the catalogue-room, newspaper-rooms, and the interior court. The entrance-hall is divided into three divisions by heavy sandstone columns, and the floor is of white marble, with the symbols and signs of the zodiac inlaid in it in brass.

The periodical reading-room occupies the north-east corner of the library (marked U on Fig. 112). It contains the current numbers of about 1500 periodicals; the back numbers are stored in the adjoining room, from whence they are taken to be bound as they accumulate. A gallery runs round the two inner walls of the room. Here are shelved the bound volumes of all the periodicals indexed in *Poole's Index*.

The corresponding rooms (marked K and L on Fig. 112) at the south-east corner of the building are used for the preparation of the card-catalogue and printed bulletins and finding lists. The adjoining room, M, is the ordering room, where lists of proposed additions are checked and new books are ordered. Under the staircase on either side are lavatories and cloak-rooms. The grand staircase is one of the principal features in the building. The walls are of yellow Sienna marble, richly variegated; the stairs of an ivory-grey French stone, mottled with fossil shells. The staircase ascends straight up for half its height, and then turns right and left round two pedestals bearing couchant lions; these were carved by Mr. L. St. Gaudens from grey marble, and are memorials of the Massachusetts men who fell in the Civil War. The ceiling is divided into rosetted caissons, with ornamented borders. From the landing of the staircase a carved oak door leads out to a balcony, overlooking the interior court. The wall of the staircase projects into the square court, and around the

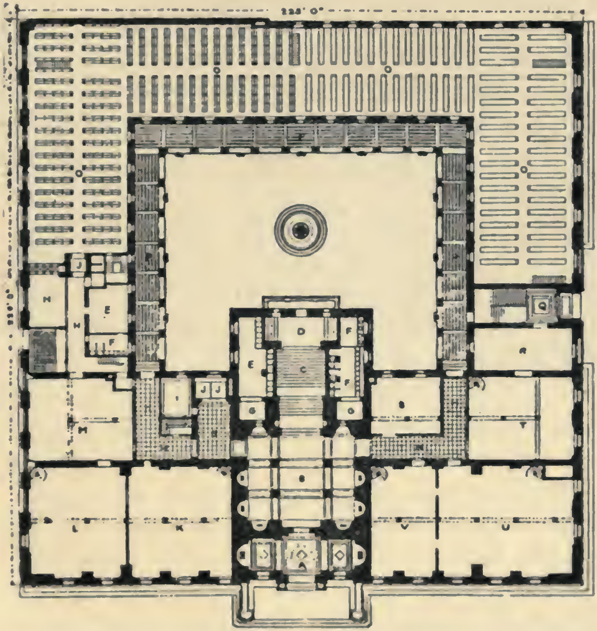


FIG. 112.—Boston Public Library—plan of ground floor.

A. Vestibule.
B. Hall.
C. Staircase.
D. Landing.
E, F. Cloak-rooms.
G. Lobby.
H. Corridor.
I. Waiting-room.
J. Elevators.
K, L. Cataloguer's rooms.
M. Receiving-room.
O. Book-stack.
P. Arcade.
U, V. Periodical reading-room.

three other sides runs an arcaded promenade, the arches, columns, and cornice being all of white marble, the whole forming a facsimile of the arcade of the first storey of the Cancellaria Palace in Rome. The inner wall of this arcaded promenade is of granite, and is pierced with two rows of windows. The floor is of red brick edged with marble, and along the wall at intervals are oak benches, so that in the hot weather readers may use the court as an open-air reading-room. In the middle of the court is a fountain, with MacMonnie's bronze statue of a bacchante in its centre. Above the arcade the walls of the court are built of brick and granite, and are pierced with windows. At the top is a closed arcade around three sides of the building, the windows of which light a corridor nine feet in width.

To return to the staircase : the first floor plan (Fig. 113) will show that it leads to a corridor or hall, with a small lobby at either end. The walls of this corridor are decorated by M. Puvis de Chavannes, the subject being "The Muses welcoming the Genius of Enlightenment." The painter has been paid 250,000 francs for this work, and the effect is very fine. The large reading-room, "Bates Hall," is entered from the corridor by a small vestibule in its centre. It is a magnificent room, 218 feet long, 42 feet wide, and 50 feet high ; a view of its interior is given in Fig. 114. The ceiling is in barrel arches, resting upon piers of brown sandstone. It is deeply panelled, every other panel containing a rosette. The ends of the hall are semicircular, and are screened off. That to the right of the plan is used as a public writing-room, and the similar portion at the other end is where a card-catalogue is kept for public use. The room is lit from the thirteen arched windows which face Copley Square and two similar ones at the south end. These are filled with temporary wooden grilles of a conventional Roman pattern, as substitutes for bronze. At the north end there are no windows, but a broad panel, which Mr. J. A. M'Neill Whistler has been

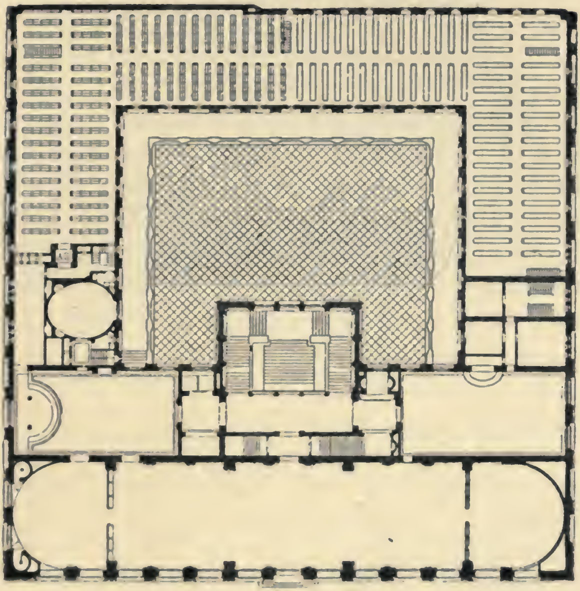


FIG. 113.—Boston Public Library—plan of first floor.

commissioned to fill. Along the west wall, and facing the windows, are ten other panels, which are also to be decorated as time and funds permit. A narrow frieze runs round the room between the piers, containing in gilt letters the names of famous men. There are thirty-two in all, and it is curious to note that no American finds a place amongst them. The Englishmen number four, and are Shakespeare, Bacon, Milton, and Newton.

The main entrance to Bates Hall is, as has been already stated, from the staircase corridor. Over the doorway is a beautiful little balcony of Indiana limestone, richly sculptured, and the most elaborate piece of carving in the building. It is reached from the staircase which leads up to the second floor of the back portion of the building, and is a fitting shrine for the bust of Joshua Bates, who gave the library in its early days $100,000, and after whom this noble room is called. The room is shelved under the windows of the east and west walls with open bookcases of oak. They contain about 7000 volumes of reference works, and may be used without the filling up of a form. There are thirty-three tables, 12 feet long by 3½ feet broad, each provided with eight chairs, and give seating accommodation for 264 persons. Each table, however, could easily seat ten if required, and so increase the number to 330. All the tables are provided with electric lamps fitted in bronze standards, and the room generally is lit from tall lamps in front of each pier. The books are obtained from the counter of the delivery room, and are brought to the readers at their seats. At the north end of the room is an elevator connected with the periodical-room below, which is used for bringing up the bound volumes of magazines.

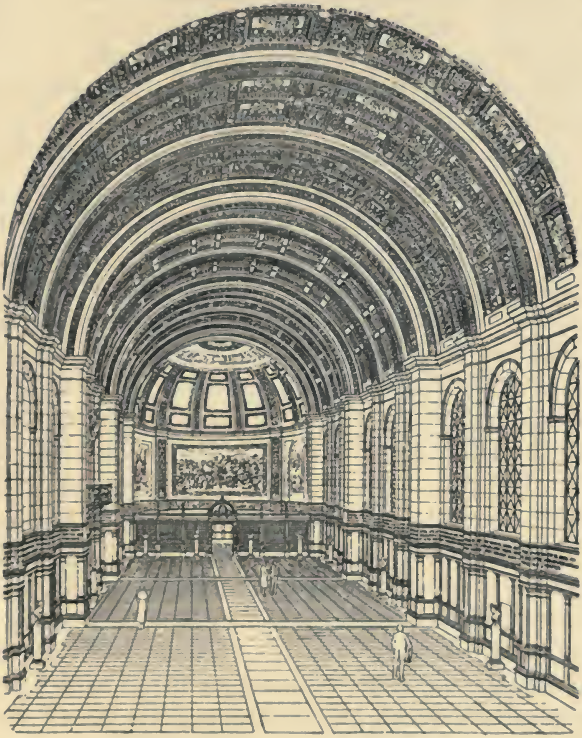


FIG. 114.—Boston Public Library—interior of the "Bates" Hall.

On the left of the staircase is a room 65 feet by 35, used as a children's reading-room. It is entered from a lobby, called the Venetian Lobby from its scheme of decoration, and is shelved for about 3000 volumes. At present about 1300 volumes are in use, and these can be read in the room by children of any age. Tickets for home reading are not given to children under twelve.

The corresponding room on the right of the staircase is called the delivery room, and in it books are obtained both for home reading and for use in the Bates Hall. It is approached through a lobby, decorated in the Pompeian style by Mr. E. E. Garnsey. A circular counter, 50 feet in length, separates the attendants from the public. On the left are doors communicating with the public card-catalogue in Bates Hall. A card-catalogue of fiction and bulletin boards for the latest additions are placed in the delivery room itself. No books are shelved in this room, but all have to be obtained from the stack-rooms in the rear. To facilitate the issue, a row of numbered pneumatic tubes, which communicate with different floors and parts of the stack-rooms, is placed at the counter. The borrower's application slip is enclosed in a carrier in one of the tubes, and so despatched to the nearest point to the book required. Each storey of the stack is fitted with a miniature cable railway track of eight-inch gauge, and book waggons (Fig. 115) to run upon it. Each stack has three stations, placed at convenient intervals, and two girls are employed to act as "runners" on each floor, to remove the application form from the pneumatic tube, obtain the book, place it in its waggon, and grip it on the cable, when it is carried to the delivery room at the rate of 500 feet a minute. Close to the delivery room counter is a well, running the whole height and depth of the stack-rooms. In this five little elevators, one for each floor of the stack, are continually working. When the book waggon approaches the well it automatically slips the cable and slides upon the elevator; if the latter is at work, the waggon is held until it is free. If it is not busy, the shock of the waggon running upon it releases a pin, and the motor below elevates or lowers as the case may be to a window at the delivery desk, where it stops. The books are returned in a similar manner, and as the car comes back to its station it is released from the cable and slides readily into its place.

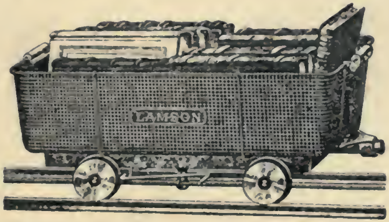


FIG. 115.—Boston Public Library book waggon.

The chief glory of the delivery room is its decoration. The ceiling is heavily raftered, and painted in the deepest tones of blue and purple. A wainscot 11 feet in height, of light-coloured oak, handsomely panelled, and with Corinthian pilasters, is in strong contrast, and above this, along two sides of the room, are the series of cartoons painted by Mr. Edwin A. Abbey, illustrating "The Quest of the Holy Grail." Mr. Abbey's pictures are five in number, and occupy the entire space between the wainscot and the ceiling on the north and west walls of the room. All are 8 feet in height, but they vary in length from 6 to 33 feet. They contain about a hundred life-size figures, and are the result of four years' study and labour. The artist received $15,000 for his work upon them.

On the same floor is the trustees' room and passage to the stack-rooms. A room for the librarian is in the mezzanine storey, and a smaller room, in which is stored the valuable collection of autographs and manuscripts presented by Judge Chamberlain. Other rooms not calling for special mention are used for the storage of patents, both American and foreign, and for newspaper reading.

The upper floor of the library (Fig. 116) over the stack-rooms is devoted to the special collections for which Boston is somewhat famous. Here are shelved in alcoved rooms, lit from the roof and from windows opening into the corridor, which runs around three sides of the internal court, the Barton, Barlow, Prince, Ticknor, and other collections. Over one of the rooms is a photographic studio, for use in making reproductions of any of the books or manuscripts.

Access to these rooms is obtained by a staircase which leads to the çentre of a hall parallel with and adjoining the upper part of the wall of the "Bates Hall." It is 84 feet long and 23 feet wide, and is lit entirely from the roof. It is called the Sargent Hall, as it is decorated by Mr. John S. Sargent. Part only of his work is as yet fixed : the complete

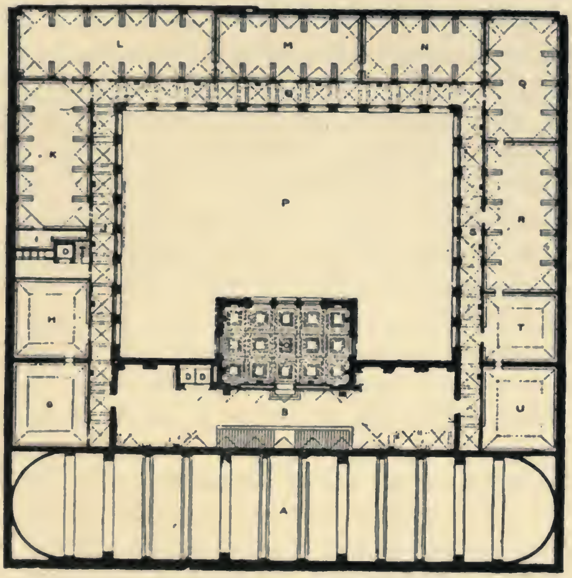


FIG. 116.—Boston Public Library—plan of second floor.

A. Top of Bates Hall.
B. Sargent Hall.
C. Music library.
G, H, K, L, M, N, Q, R, T, U. Special book collections.
J, O, S. Open galleries.
P. Open area.

scheme is to represent "The Triumph of Religion over Paganism and Polytheism." It will be remembered that a portion of this work was exhibited at the Royal Academy in 1894, and so great was the admiration it excited when fixed at Boston, that a public subscription was started to defray the expense of completing the scheme of decoration, so that it should comprise the whole gallery. The artist is to receive a fee of $30,000 for the complete work. Opening from the centre of the Sargent Hall, and situated over the grand staircase, is one of the most attractive rooms in the building. It is 50 feet by 30, and is shelved for the collection of musical books presented to the library by Mr. Allen A. Brown.

The stack-rooms which hold the library proper extend around three sides of the building. They are 40 feet across, and have a series of double bookcases, each twelve feet in length, placed at right angles to the outside walls and inner courts. A central gangway runs down each stack-room, and a narrow passage is left between the ends of the cases and the walls. The stacks are six storeys in height, and will accommodate over a million volumes; this added to the shelving in the special libraries, Bates Hall, periodical room, &c., would make the library's total capacity over a million and a half. The stock at the present time is about half a million volumes, and the average annual increase about 25,000.

The library has for some time printed its card-catalogues on the premises. It now possesses the

Mergenthaler type-setting machines, which set up and cast the titles in separate lines. By this means the title once set can be preserved and used again when necessary, and the cost of the composition for future catalogues is saved.

The building is lit by the electric light, which is generated in the basement. The system of ventilation is similar to that in use in the Aberdeen Public Library, described at pages 37, 38. The fresh air is drawn through a grating from the interior court by means of an eighteen-foot fan, capable of moving 40,000 cubic feet a minute. It is strained through bags of cotton to free it from dust, and in cold weather passes through a hot chamber, and is heated before entering the library. An exhaust-fan is placed in the roof, which helps to draw out the foul air. The engine used for the production of the electric light is also used for working the ventilating fans.

Some of the arrangements of the building are open to criticism from a librarian's point of view. One is the situation of the delivery room. It will be noted that it is upstairs, and at the extreme end of one side of the stack-room, one counter serving both for the readers who wish to use books on the premises, and for those who require them for home reading. In most of the larger British libraries the two departments are kept distinct, and it is almost an axiom that the books for home reading should be issued on the ground floor. The use of elevators minimises to some extent this objection, but it would be better if a room on the ground floor could be used for the purpose. The situation of the children's room, on the first floor, adjoining Bates Hall, seems also faulty. If the room is largely used, as it is sure to be, the noise inseparable from a large concourse of young children must be a nuisance to readers using Bates Hall for study. The proper place for such a room is on the ground floor, close to one of the street entrances.

There must be considerable delay in obtaining a book from some parts of the stack-room, which would not occur if the delivery desk were placed centrally, instead of in its present position. The proper place for the reading-room seems to be in the centre of the building, with the books arranged in stacks around it. If the plans of such a library as, say, Strassburg (Figs. 137, 138), or of Leipzig (Fig. 136), be carefully examined, it will be seen that the average distance of a book from the point of issue is much the farthest at Boston, and, of course, the period of waiting for the borrower is increased.

The natural lighting of the stack-rooms is insufficient; in many places it is necessary to burn electric light the whole day, at great expense, and with much discomfort to the attendants. An examination of the plans of many of the larger libraries figured in this volume will show that it is possible to have sufficient windows to give light between each bookcase in the largest stack-rooms, without destroying the distinctive architectural features of the outside of the building.

Reference has already been made in Chap. I. to the advisability of keeping the ornamentation of the public rooms of a library in a subsidiary position. The noble examples of decorative art which have been obtained for Boston, while most creditable to the æsthetic taste of the inhabitants, make the public rooms art galleries instead of places for study. The two objects are quite incompatible; each is excellent, but they brook no rivalry, and the crowds who gather to inspect the decorations are a nuisance to the student, who wishes for quiet. In the report of the examining committee of the Boston City Council for 1895, the following pregnant sentence occurs: "The disturbance caused to readers by the influx of visitors, attracted solely by the mural paintings, should warn the trustees of the extreme caution that should be employed in extending the decoration of the walls to rooms occupied by readers."

The new building for the Library of Congress at Washington is now finished, and is expected to be opened in 1897. It has been built under the charge of General T. L. Casey, from the modified plans of Messrs. Smithmeyer & Pelz.

The site of ten acres, which was purchased for $585,000, is situated opposite the Capitol, and at a distance of about 1270 feet from it. The building itself covers about three and a half acres, and is 470 feet by 340 feet. It has frontage on all four sides, and is also lit from four large interior courts. There are three floors, comprising a basement 14 feet high, first floor 19 feet high, and a second storey 29 feet high. The walls are 69 feet high to the roof, and the apex of the dome 195 feet from the ground. The order of architecture is the Italian Renaissance, the central front and corner pavilions being projected to relieve the monotony of the long façade.

The base or lower storey of the building is in white rusticated granite, the upper walls being of smooth bush-hammered granite. The roofing is throughout of sheet copper. The centre dome over the reading-room is covered thickly by gold leaf, which it is expected will prove to be a more economical finish than paint requiring frequent renewal.

The chief entrance is in the centre of the frontage, facing the Capitol, and gives admittance by bold flights of outside stairs to a large hall, 100 feet square (Fig. 117), containing staircases, elevators, cloak-rooms, and other offices. At the back, and in the exact centre of the site, as shown in Fig. 117, is the reading-room. This is an octagonal hall, 100 feet in diameter and 125 feet in height, lit by eight semicircular windows, each 32 feet wide. It is seated for 250 readers, allowing to each a desk 4 feet in width. The superintendent's desk is on an elevated platform in the centre, commanding a view of the whole room. The interior walls are covered with light-coloured marble, the eight massive pillars supporting the ceiling having bases of dark chocolate marble.

Opening out of the reading-room on either side are the stack-rooms for the storage of the books. They are 45 feet in width and 112 feet in length. The height of each room is 65 feet, and they contain nine tiers or floors of bookcases, each 7 feet in height, the first two corresponding to the basement, the next three to the first floor on the level of the reading-room, and the remaining four to the top storey of the main building. The floors are of white marble, and light is obtained by a series of windows on either side of the stack-rooms. The bookcases are placed at right angles to the walls, with a window of plate glass, in one piece without sash, between each, a gangway 3½ feet wide separating them, with a central aisle double the width.

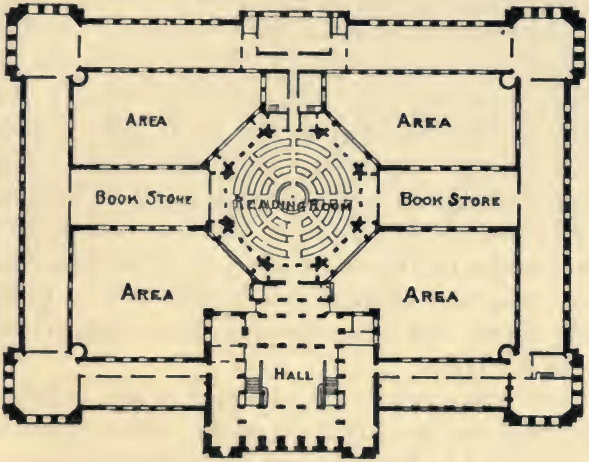


FIG. 117.—Ground plan of the Library of Congress, Washington.

The bookcases are of steel, and have been treated by the Bower-Barff process for prevention of rust. The shelves are 38 inches in length and 12 inches deep. They are not solid, but are formed of parallel bars of steel, fixed in a framework about a quarter of an inch apart, the top surface of each bar being slightly rounded. The shelf framework at either end hooks into the vertical supports, and by slightly tilting can be removed or raised. They can be adjusted at intervals of an inch. A book support has been designed for these special shelves, which is useful, and easily applied. It is a thin plate of steel about 8 inches by 6, with a short piece of wire projecting from the centre of its shortest side. This goes through the shelf between any two of the bars, and is kept in position by a thumbscrew on the other side. If required for tall folios a second support can be screwed on to the shelf above and hang downwards to support the top of the book.

Each stack-room will shelve 800,000 volumes. The shelving already fixed in the whole building is estimated to be sufficient for about two million volumes, and the ultimate capacity of the library, when shelved to its full extent, will be upwards of four and a half million volumes.

The remaining floor space of the first storey is used for various administrative purposes, including the copyright records and the housing of the scientific library belonging to the Smithsonian Institution. The second floor contains an art gallery, 217 feet by 35 feet, and a similar sized room for the great map collection of the library.

The area of the library floor and connecting rooms is about 111,000 square feet; while the total floor space of the whole building is 327,000 square feet, or nearly eight acres. For the cost of the building a sum of $6,175,000 has been voted by Congress, and it is expected that the entire cost will be a little less than this amount.

The library is not only the great national collection of books, but has to answer the purpose of a general reference library for the use of members of Congress meeting in the Capitol, a quarter of a mile away. To enable this to be done without undue delay, a subway 1300 feet in length has been constructed between the two buildings. This is deep enough to permit workmen to pass through for the necessary repairs, &c. It carries pneumatic tubes and telephones, and a wire cable carrying book holders (shown in Fig. 45), driven by an electric motor. These carriers travel at a high rate of speed, and do not occupy more than two minutes in transit between the terminals.

The Mercantile Library Association of New York was founded in 1870, and, after several removes, is now located on the two top floors of a fine corner building, which is its own property. It was opened in 1891, on the seventy-first anniversary of the founding of the Institution. It is a fireproof structure of sandstone and brick, seven storeys in height, with a frontage to three streets. The site is an oblong wedge in shape, its average width being about 150 feet, and its depth varying from 52 feet to 98. The library occupies the sixth and

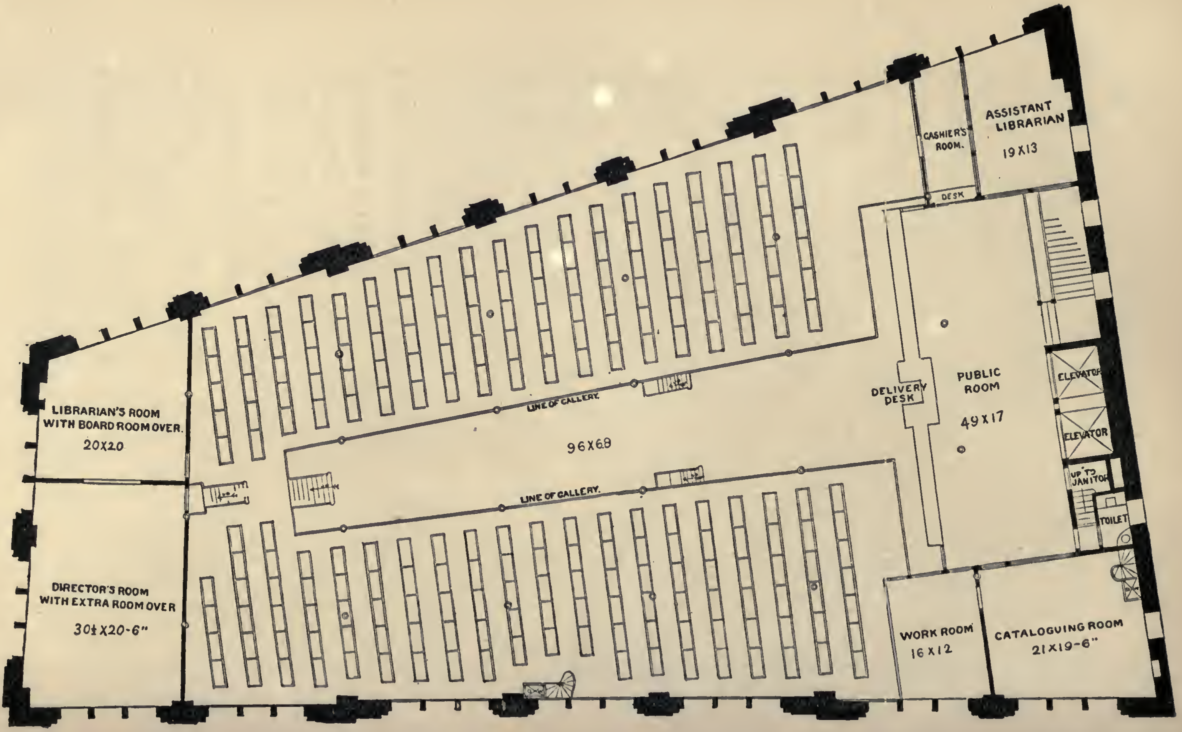


FIG. 118.—Plan of the lending department of the Mercantile Library, New York.

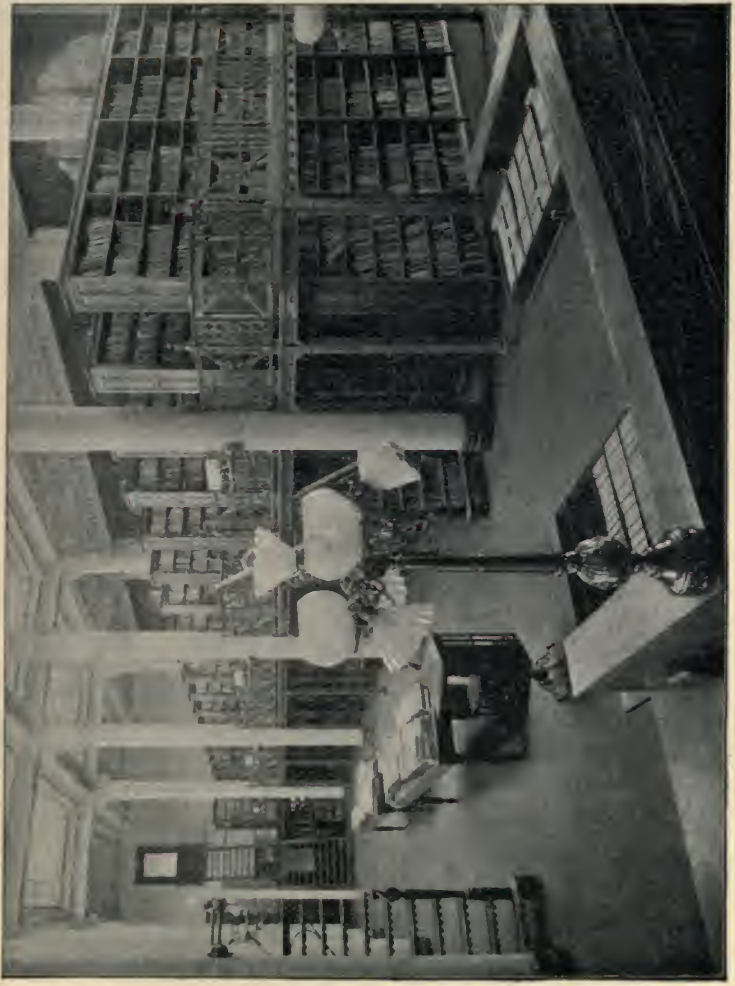


FIG. 119.—Book-stack and delivery counter of the Mercantile Library, New York.

seventh floors, which are reached by two steam elevators.

On the top floor is placed the lending department (Fig. 118), in a noble room covering the whole area. The elevators give access to a space for the public in front of the delivery counter, 49 feet by 17. On either side two rooms are partitioned off for catalogue work, cashier, &c., and at the other end are placed the librarian's office, 20 feet by 20, and a directors' room, 30 feet by 27. The whole of the central space, 96 feet by 69, is used as a stack-room for the storage of books. It is lit from both sides, and also from a skylight occupying two-thirds of the roof area, and forms one of the best rooms for the purpose in the country. The height of the room is 25 feet, and the bookcases are arranged at right angles to the two walls, leaving a central passage 15 feet in width. It is intended to place here three stacks of bookcases, each 7 feet in height, but at present only two are in position. The bookcases are double, and are 18 inches in width, the alleys between them being 3 feet wide. Access to the second tier of cases is gained by straight flights of staircases in the central passageway, and as the cases are only 7 feet in height, ladders are entirely dispensed with (Fig. 119).

The stairs and flooring of the stack are of perforated iron, the bookcases themselves being of wood. The full storage capacity of this floor is nearly half a million volumes.

The reference department and reading-room is on the sixth floor, and is the same size as the room

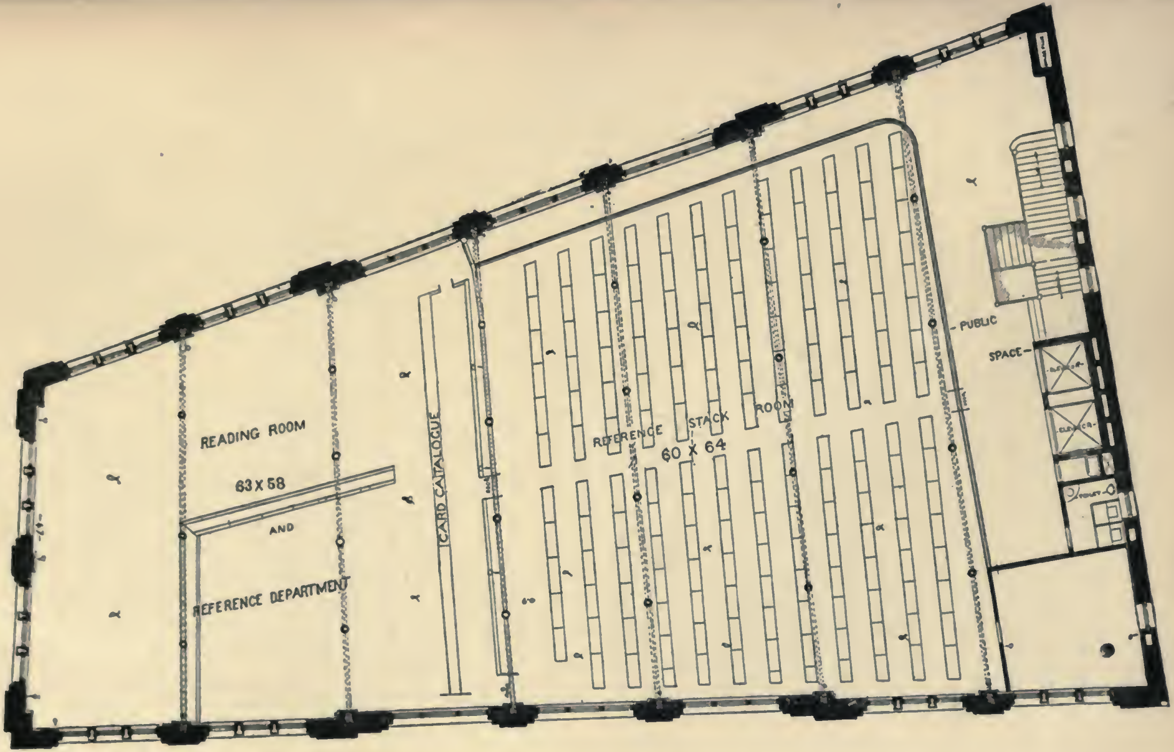


FIG. 120.—Plan of the reading-room floor of the Mercantile Library, New York.

above. It is divided by screens into two apartments, one of which (63 feet by 58) is used as the reading-room, and the other (60 by 64) is shelved as a stack-room (Fig. 120). A notable feature of the reading-room is the oak periodical and newspaper case in the centre. No files of any kind are used, but the current numbers of over 600 publications are placed here, each compartment having the name in gold letters of the periodical or paper it contains. The back numbers are filed behind the attendants' desk. The room has numerous tables of convenient size. Students and readers wishing to order books for reference can do so without leaving their chairs, as each table is furnished with a compartment containing blanks. They also have drawers on either side, wherein are found supplies of paper for use of members. Immediately in the rear of the reading-room is the storage-room for the books belonging to the reference department. The storage capacity is about 140,000 volumes. At present it contains about 50,000 volumes, principally the documents of the national and state governments, and bound volumes of newspapers and magazines. The library is lighted throughout by electricity.

CHAPTER XII

AMERICAN LIBRARIES (*continued*): THE NEWBERRY LIBRARY (CHICAGO), BUFFALO, MINNEAPOLIS, CORNELL UNIVERSITY, MILWAUKEE, THE PRATT INSTITUTE (BROOKLYN), THE PEABODY INSTITUTE (BALTIMORE)

REFERENCE has already been made in Chapter III. to the plans for library building which the late Dr. W. F. Poole of Chicago advocated, and in the Newberry Library, opened in 1896, he had an opportunity of carrying out his views.

The portion now built occupies one frontage only of a block 318 feet by 213, which has a street frontage on all four sides. The entrance is placed in the centre of one of the longest sides, and the building when completed is intended to reach round the whole square, in a series of rooms 45 feet deep, each lit from a central court on one side, and from the public streets on the other. Each floor is fireproof, and each room in which books are stored is to be separate and have no communication with other rooms, the only means of access being from staircases and elevators in the inner court, which give admittance to a corridor on each storey running around the interior of the building.

The contents of the library are divided into large classes of literature, and all books in any particular class are to be shelved in one room, which is also to be used by the readers of that particular class of literature. A person wishing to study American history, for example, would find in the entrance-hall a porter, who would direct him to the particular room in which the books he required were shelved. On reaching it he would find that about three-fourths of the room was occupied by double book-cases, 8 feet high, placed at right angles to the walls, and in charge of an attendant, who would have a special knowledge of this particular part of the library. The remainder of the room would have tables and desks for reading. If books in another class are wanted the reader must go to the particular room in which they are stored, or the books must be brought to him by an attendant.

Several special advantages are claimed by Dr. Poole for this plan, as compared with the alcove and stack systems of shelving books. He contends that he avoids the enormous waste of space in the centre of the building which occurs in libraries like the Baltimore Peabody Institute or the London Guildhall, and that he escapes the difficulty of uniformly heating large rooms 50 feet or 60 feet in height. By his plan, he says also, the danger of fire is greatly diminished, for if it broke out in any room it would be confined to that particular room, and could not spread. Another advantage claimed is that the attendants are more likely to know all about the comparatively few books in their section than they would if they formed only a part of the large collection.

Dr. Poole's objections to the stack system of shelving are based upon the difficulty of ventilating stacks of four to six storeys, and the bad lighting which is experienced in the middle of the stacks. He also has much to say about the injurious physical effect of the staircases upon the assistants, who have to frequently use them. The problem which Dr. Poole has tried to solve is of the greatest interest to all who have to do with extremely large libraries. His plan would not be workable in libraries of less than, say, 100,000 volumes, for he contemplates that some of his rooms must contain shelving for 50,000 books in order to hold comfortably all the books in some of the classes.

The front of the Newberry Library building is five storeys in height. It is estimated to hold a million volumes, the total shelf capacity of the whole building when completed being four millions.

The new building of the Buffalo Library, U.S.A., was opened in 1887. It was built from the plans of Mr. C. L. W. Eidlitz, and has four principal floors, of which the library occupies the ground floor and part of the basement and first floor. The building is Romanesque in style, and is peculiarly effective in colour, the materials used being a warm brown sandstone, pressed red brick, and terra-cotta, with red tiles on the roof.

The building is erected on a corner site, somewhat angular in form, and the entrance is planned on the longest side, nearly at the angle (Fig. 121).

On entering the building a large lobby gives access to the delivery room on the left, and the main staircase on the right. A reading-room, 50 feet by 38 feet, for periodicals occupies the angle. The delivery room is 56 feet by 40 feet, and has a counter running across one side of it, with a door at the one end into a catalogue-room, 40 feet by 31 feet, and at the other into the stack-room. The latter runs half the length of the longest side of the site, and is 138 feet long by 50 feet wide, and 21 feet in height. A public passage-way runs down the centre, giving admittance to a special reading-room at the east end, 50 feet by 35 feet. The frontage on the south side

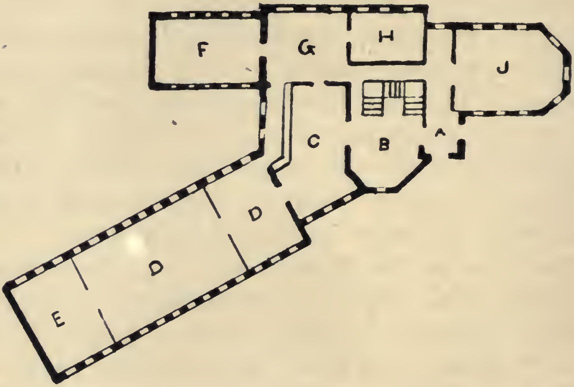


FIG. 121.—Ground plan of the Public Library at Buffalo.

A. Entrance.
B. Hall and staircase.
C. Delivery room.
D. Stack-rooms.
E. Special reading-room.
F. Study.
G. Cataloguer's room.
H. Librarian's office.
J. News-room.

is much shorter than that on the north. The newspaper-room, as has already been said, occupies the corner. Next to it is the librarian's office, with a door into the catalogue-room at its side, and the end room is the study room, 50 feet by 32 feet, which is shelved for ordinary books of reference.

The first floor contains a ladies' reading-room, of the same size as the newspaper-room beneath it, and room for chess, committee meetings, and lectures. The arrangement of the stack-room is as follows :—The bookcases are in a double row, right and left of the central gangway. They are 7 feet in height and 15 feet in length, and are divided into five divisions of 3 feet each. They are 18 inches in depth from back to front, and have no centre divisions. They are constructed of iron, and consist of upright standards made of 1-inch iron pipe, on which cast iron cross-pieces, flanged to receive the shelves, slide up and down, the cross-pieces being kept in position and adjusted by steel screws. The room is 22 feet high, and could take three tiers of 7 feet cases if necessary. At present only two tiers have been erected ; the floor between them is made of thick rough glass, and iron gratings. The cases are 32 inches apart, and a passage 10 feet wide is railed off down the centre of the room for the public, light iron bridges running across to allow passage from the upper storeys of one book-stack to the other.

The general plan of the library is excellent, and the difficulties of the site have been well met by the architect.

The Minneapolis Public Library was erected in 1890, from the designs of Messrs. Long & Kees. It is situated on a corner site, 190 feet deep, with a frontage of 132 feet. The plans for the building contemplate covering the whole site, with an open quadrangle, some 60 feet square, in the centre, but at present only the front and one side have been erected.

The main entrance is in the centre of the principal front, which is built of brown sandstone, and gives admittance by a short flight of stairs to the first floor, with a reading-room for newspapers on the right, and a ladies' room on the left.

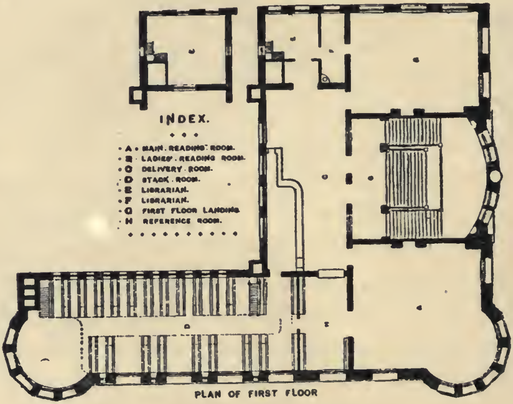


FIG. 122.—Plan of ground floor of the Minneapolis Library.

The delivery room faces the main entrance-hall, and has a counter running across it, as shown in Fig. 122. It is lit from the open area, and communicates with a stack-room by an entrance at the side. The bookcases are of iron, and are placed at right angles to the walls between the windows. They are each 10 feet in length, and have a central gangway 6 feet in width. The stack-room is two storeys in height. The storey on the ground floor has one tier only of bookcases, 10 feet high, while that on the first floor, which is level with the delivery room, has two tiers, each 7½ feet high. The height of the room is 18 feet, and so a space of 3 feet is left between the top of the upper bookcase and the ceiling.

The bookcases are simple in construction. The uprights are of iron tubes, 1½ inches in diameter, and the shelves, of polished cherry wood, are supported on steel brackets, which slide up and down the uprights, and are kept in place by set screws. The cases are double, and shelve books on either side; they are placed 3 feet apart, and the three bottom shelves are 32 inches from back to front, while those above are 16 inches. This gives a ledge on each side of the case 8 inches deep. The cases used for bound newspaper volumes and large folios are of somewhat different construction. In place of shelves they have a series of wooden rollers, and the books are kept flat on their sides.

The ground floor contains a room for juvenile readers, 56 feet by 24 feet, and several special rooms for patents, medical books, and study. The area available for readers in the large public rooms is nearly 6000 square feet, and gives accommodation for 400 persons, with room for about 100 more in the smaller rooms. The second floor is used at present for an art gallery, museum, and art school, but it is expected that it will be necessary soon to complete the building, and devote the whole of it to library purposes. The shelf capacity at present is for about 100,000 volumes, but the whole building is expected to accommodate upwards of a million.

For several years the library of the Cornell University, Ithaca, had been cramped in its work for lack of shelf-room, until in 1888 Mr. Henry W. Sage offered to erect a new building, which should be a worthy home for the fine collection of books owned by the University. The designs of Mr. W. H. Miller were chosen, and as the architect has throughout worked in harmony with Mr. George W. Harris, the librarian, an exceedingly convenient building has been erected. Study of the accompanying plans will show how all the great requirements of an university library, such as compact storage of books within easy access of the delivery desk, economy of administration, abundance of light and ventilation, and the comfort of readers, have been recognised and provided for.

The library was opened in 1891, and stands at a corner of a quadrangle formed by the other University buildings. The ground slopes rapidly to the south and west, and allows the reading-room, which is entered at the ground level on the east side of the building, to be placed at the vertical centre of the seven-storey stack-room. The delivery desk is thus level with the middle of the stack, and has four storeys above it and three below. The stack-rooms are in two wings placed at right angles to each other, and have a present capacity of about 400,000 volumes. The most distant book is only 120 feet from the centre of the delivery desk, and as each storey is only seven feet in height, there are no books beyond easy reach from the floor.

The dimensions of the building are 170 feet by 153. The general outline being somewhat in the form of a cross, the book-stacks, I I (Fig. 123), occupying the southern and western arms, the reading-rooms, A B, the eastern, while the northern provides accommodation for the offices of administration, the "White" Library, and seven seminary rooms.

The main entrance is in the north-east angle of the building, and over the door is a beautiful bronze medallion of Mrs. Jennie M'Graw-Fiske, in memory of whom the library was built and endowed by the donor. The entrance-hall, C, is lit by a skylight, shown in Fig. 124. On the right are cloak-rooms, D and E, for men and women, and checking room, K, for an attendant. The hall is fitted with seats and open fireplace, so that it can be used for conversation without disturbing the readers. From the inner hall, C, is entered the general reading-room, A, the reading-room for periodicals, B, the librarian's room, H, and the cataloguing room, G. The periodical room, B, is 50 feet by 21, and is lit by windows 8 feet from the ground. Under these run a range of wall bookcases, holding about 7000 volumes.

The general reading-room, A, is 126 feet by 66, and will provide seats for 220 readers, allowing for each a desk 2 feet by 2 feet 10 inches. This room is lit partly by a range of windows, 8 feet from the floor, extending round the south and east sides of the room, as shown on the plan, and partly by a range of clerestory windows, shown in Fig. 124. A comparison of the two plans will show that the south side of the general reading-room and the reading-room for periodicals form, as it were, two aisles

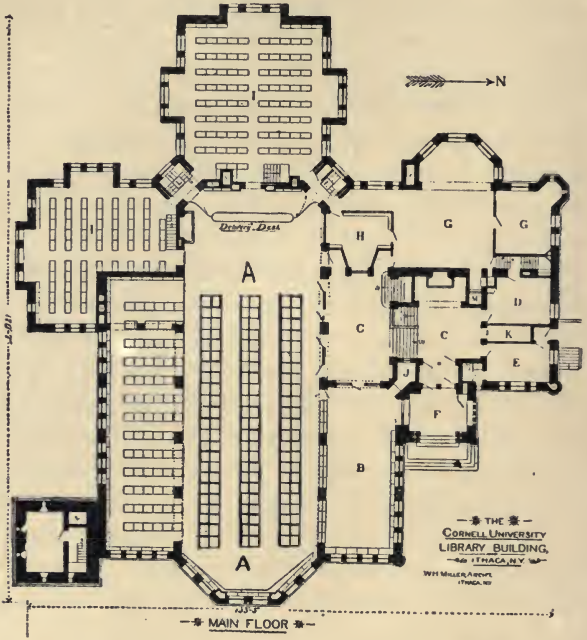


FIG. 123.—Plan of main floor of the library, Cornell University.

adjoining the main portion of the large reading-room, which runs up to a much greater height to allow space for the clerestory windows. A plentiful supply of light is thus obtained; in fact, there is a window area of over 1000 square feet to a floor area of 6600. In the south aisle the reading tables are single, but in the nave the tables are of double width, with a longitudinal division, as in the British Museum, and run lengthwise of the room. Around the walls of the room, beneath the windows, are bookcases for a general reference library of about 8000 volumes, within reach of all the readers. The delivery desk is at the west end of the room, chiefly lighted by a large skylight, and close behind it are the entrances to the stack-rooms.

The dimensions of the west stack, immediately behind the delivery desk, are 47 feet by 44, and its book capacity is 254,000 volumes. The south stack is smaller, as the reading-room takes up part of the area, its capacity being 150,000 volumes. In the stacks the windows are all placed between the ranges of bookcases, while the large bays, of which there are three in the west and two in the south stacks, are provided with tables for special students. In the angles formed by the junction of the stacks with the reading-room are staircases and book-lifts, marked L on the plans. The stacks are of iron, with wooden shelves.

Adjoining the reading-room is the librarian's room, H, which is so placed as to be easily accessible to students needing assistance. The cataloguing room, G, is 45 by 22 feet, with a large bay 20 by 15 feet, and is divided into alcoves by short bookcases at right angles to the east wall, containing the bibliographical collection. In the large bay stands the work table, hexagonal in shape, with a revolving bookcase in its centre, containing the books most frequently needed by the cataloguers. Six persons, each with 4 feet of desk space, can work at this table without interference,

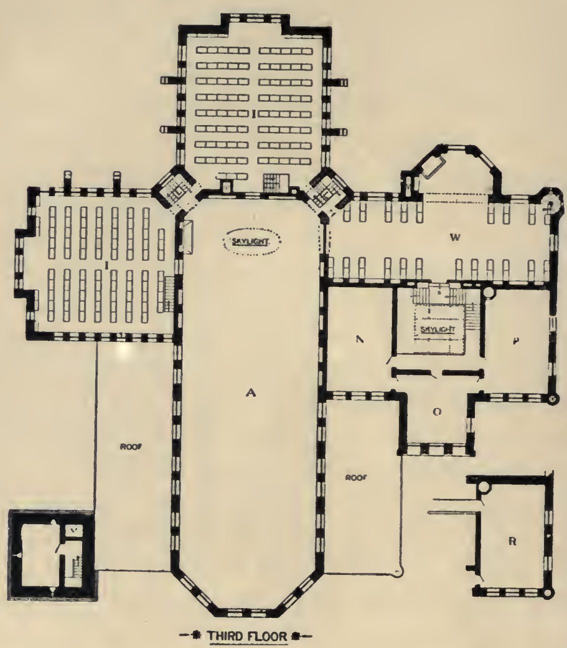


FIG. 124.—Plan of the third floor of the library, Cornell University.

and the most useful reference books are within easy reach of all. Books are unpacked in the basement, and are brought to this room by the book-lift, M.

From the inner entrance-hall, C, a staircase leads to the "White" historical library. This is shelved in the large room, W (Fig. 124), which is 66 by 23 feet, exclusive of the large bay, and extends through two storeys into the roof. This room is arranged upon the alcove system, and is intended as a study for historical students. In the open central space are large reading tables, and in each of the twelve alcoves is placed a small study table. Its ultimate book capacity is 50,000 volumes. The rooms on this floor, marked N, O, P, R, are used as seminary rooms, and are each shelved with books appropriate to the studies for which they are intended.

In the basement, which is approached by a staircase from the entrance-hall, are four other seminary rooms, the receiving and packing rooms, and a lecture-hall, seating 900 persons. These are all well lit, as from the sharp slope of the site it has been possible to have windows on each side of the building.

The Milwaukee Library and Museum, now in course of erection, is expected to be finished this year. It is built from the designs of Messrs. Ferry & Clas of that city, the internal plan being founded upon the suggestions of Miss Theresa West, the late librarian.

The site is central, and has a frontage of about 300 feet to one of the principal squares, occupying the whole of its southern half. There are streets both east and west, so the building has light on three sides and a portion of the fourth.

The dominant feature of the building is the entrance in the centre of the Grand Avenue front. The large entrance-hall forms a rotunda, lit from the roof, and from it, running right and left, is a corridor giving access to the museum portion of the building to the west and the library portion to the east and north. The building is set back some 25 feet from the street, and across the façade is a terrace enclosed by a balustrade at the street line. The rotunda or entrance-hall is the common ground of both library and museum, the centre which all visitors must enter. An attempt has been made, therefore, to make it as beautiful as possible, with rich and fine ornament in mosaic and marble. On either side, to left and right, are staircases leading to the upper floors, and two passenger lifts for the same purpose. Directly north of the rotunda, and entered by three large doorways, is the delivery room of the library (Fig. 125). This is one storey only in height, and is lit from the roof. It is about 80 feet by 26, and has a counter with returns running the full length. On the left of the delivery room is a children's room, about 40 feet by 25, and on the right a room of similar size for the public use of the catalogue; both of these rooms are directly accessible to the assistants from behind the counter.

North of the delivery room, and opening into it by four doorways, is the book-stack, built in the form of three sides of a hollow square, the end

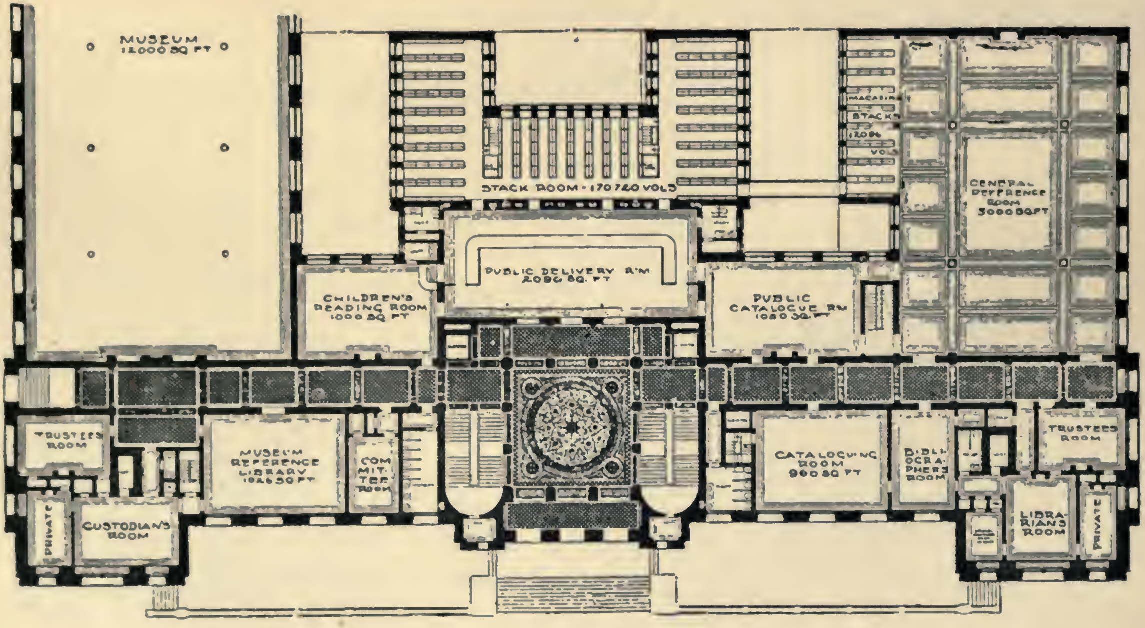


FIG. 125.—Ground floor plan of the library and museum, Milwaukee.

walls being solid as they reach the edge of the site. The ground here slopes sharply down, and consequently makes an advantageous arrangement of the floors of the book-stack possible. Two floors are below the level of the delivery room, and are still above ground, with abundance of light. For the present only four floors of the book-stack have been constructed—two below the delivery room, one on its level, and one above. The piers and foundations, &c., are planned for a further possibility of ten floors, and will then only reach the height of the main building. As no part of the stack wing is visible from the street, its exterior appearance has been of no importance, and it has been possible to build it for internal convenience without consideration of the outside effect. Each floor of the stack will shelve about 40,000 volumes, and is a separate storey, with individual heating and ventilating arrangements. The aisles are three feet in width, and the gangways four. A staircase and book-lift to each have been provided directly behind the counter of the delivery room. Following the corridor eastward we reach the reference reading-room on its north, and librarian's office and other rooms for administration on its south.

The reference room is a noble room of fine proportions; it is 80 feet in length by 54 in breadth, and 32 feet in height in the centre. Opening out of the western site is an annexe, in which are shelved bound sets of periodicals, &c. From here a bridge spans the open court, and gives easy communication to the main stack-room. The sharp

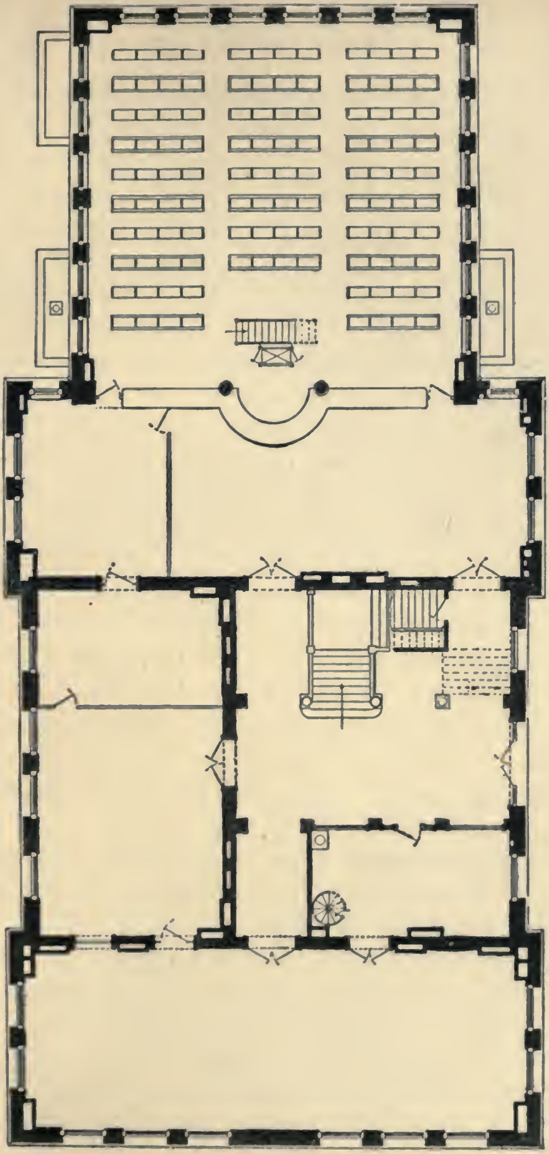


FIG. 126.—Ground floor plan of the Pratt Institute, Brooklyn.

slope of the ground, spoken of in connection with the stack-room, gives certain advantages to the reference room also. The street adjoining is so steep as to be undesirable for heavy traffic, and the high basement necessary to keep the floor of the room level with the entrance-hall gives the effect of an upper storey situation, and consequently the room is very quiet and free from outside noises.

The newspaper reading-room is under the reference room, and is of similar size. It has a separate entrance from the side street, and although nominally in the basement, is as well lit as the room above. In other parts of the basement are situated unpacking rooms, with book-lifts and service staircase connected with the cataloguers' room; bindery, delivery station rooms, and janitor's rooms and offices.

The administrative rooms of the library are in the south-east corner of the building, and are reached from the main corridor. The cataloguers' room is directly opposite the public catalogue room, and near it are placed the librarian's office and other rooms.

The second storey has a suite of rooms intended for special uses and collections, and a lecture-room seating about four hundred.

Amongst the newer American libraries, the Pratt Institute, Brooklyn, is worthy of attention. It was founded in 1888, and removed to its new building in the summer of 1896.

The main building measures 70 by 100 feet, and is three storeys in height, with a stack-room attached, 49 by 53 feet in area, and five stacks in height. The entrance is on the longest side, and the large hall gives access to the delivery room of the lending department, a children's reading-room and library, librarian's office, and newspaper and periodical room. In Fig. 126 will be seen the disposition of the rooms upon the ground floor. The librarian's office is 26 by 14 feet, and is fitted with speaking-tubes and telephones to all parts of the building. Facing the entrance is the children's reading-room and library, 25 by 45 feet in area, furnished with miniature chairs and tables suitable for the varying heights of the occupants. The general reading-room is 66 by 24 feet, well lit by windows on three sides, and containing stands and racks for over two hundred newspapers and periodicals. A corresponding room, of the same area, on the left is the delivery room for home reading, and occupies the whole western end of the main building, with the stack-room adjoining it. Reference to Fig. 126 will show the arrangement. The borrower enters at the north door from the hall and finds the card catalogue on his left, and at the nearer end of the counter the desk for returns, to which 17 feet is devoted. The curving counter extends across the room, and is 51 feet in length, being the full width of the stack-room. At the south end of the room is a space 16 feet by 24, railed off for the registration of borrowers, filing of applications, &c. At either end of the counter a gate leads to the stack-room, and behind the counter, and at its centre, there is an electric book

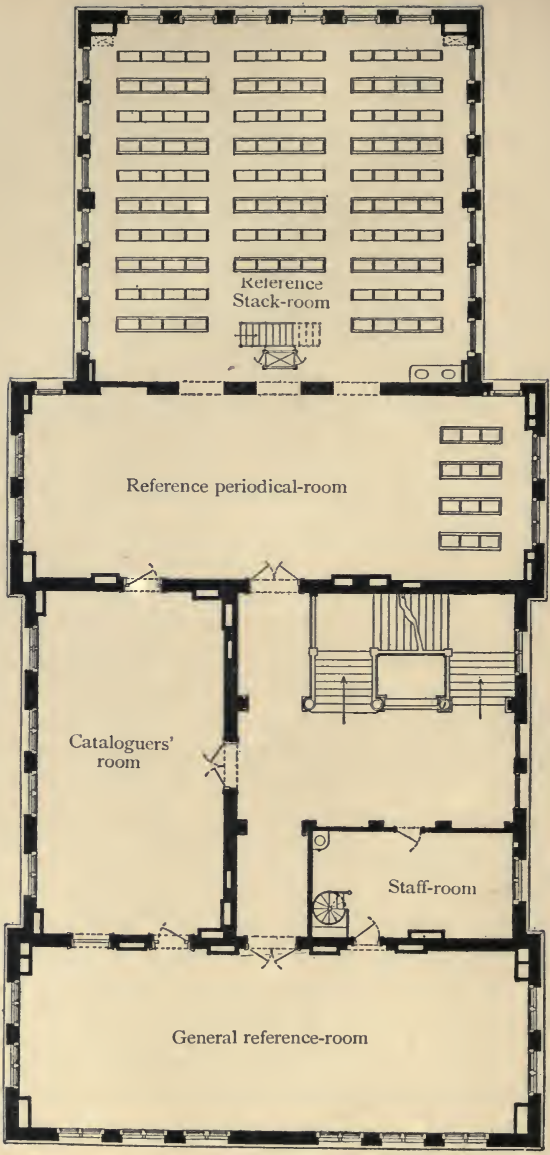


FIG. 127.—First floor plan of the Pratt Institute, Brooklyn.

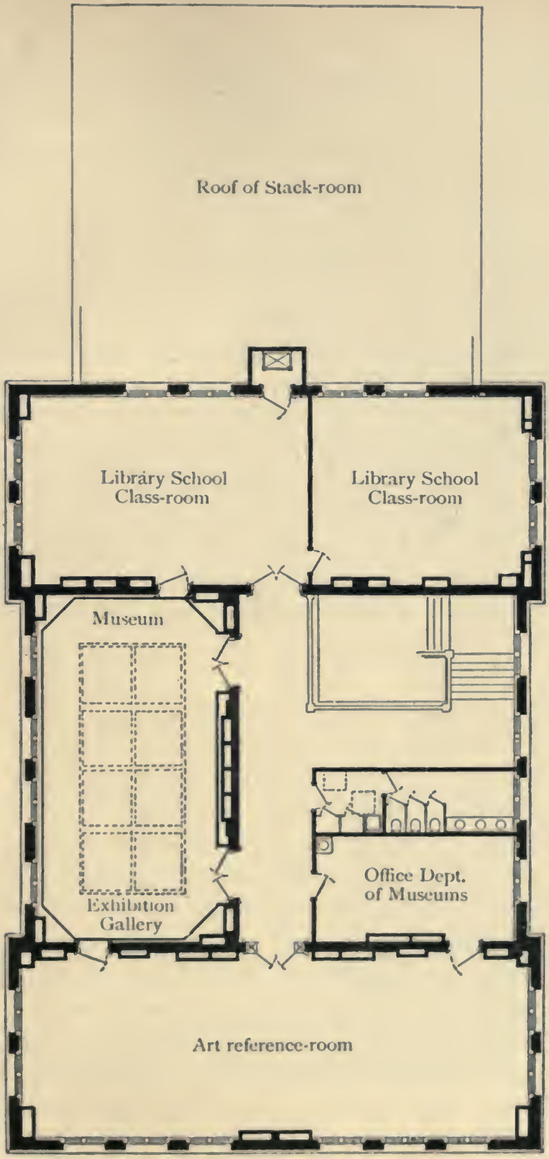


FIG. 128.—Second floor plan of the Pratt Institute, Brooklyn.

elevator. In Fig. 129 is shown the delivery desk and the ends of the bookcases in the stack-room, and a series of easy staircases connecting the stacks from the basement to the top storey.

The floors of the stack-room are of glass slabs, 10 by 18 inches, set in an iron framework. The shelves are of oak, with iron uprights, and supports electroplated in copper. Ventilation is provided by means of a space covered with wire-netting, 3 inches in width, between the glass flooring and the stacks. The central aisles are 39 inches wide, and the cross aisles 27 inches. Each floor will accommodate about 40,000 volumes, and the whole room will shelve about 200,000.

The staircase in the entrance-hall gives access on the second floor to the general reference room, reading-room for periodicals, and rooms for the staff and cataloguing. A plan of the arrangement will be seen in Fig. 127. The general reference room is directly over, and the same size as, the newspaper-room on the ground floor. It is shelved around the walls for ordinary works of reference, and contains fifteen tables for readers. The other reference room on the west contains the bound files of periodicals, which are shelved around the walls and in four double cases at the north end. Nine tables are provided for readers, and in this room are used the books shelved in the adjoining stack-room. The cataloguers' room connects the two reference rooms, and in it is done most of the private work of the library.

On the topmost storey (Fig. 128) there are rooms

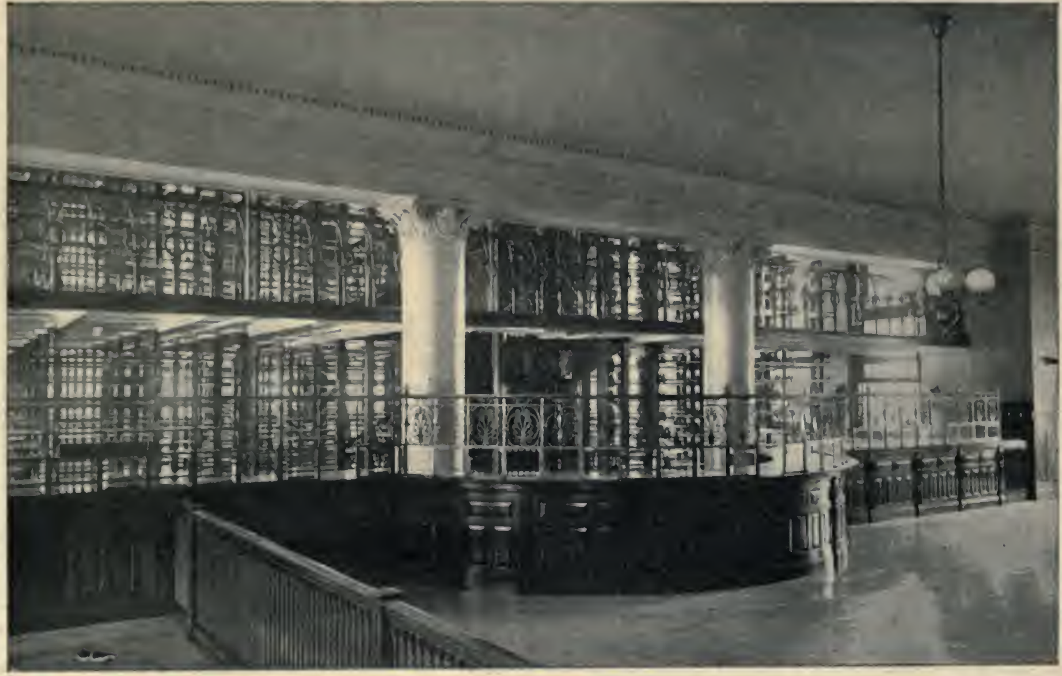


FIG. 129.—The delivery-room and stack-room of the Pratt Institute, Brooklyn.

for students studying library economy, a museum, and an art reference room equipped with proper cases and tables for consulting the large and costly art works. The basement has rooms for repairs, rebinding, &c.

The cost of the building and furniture has amounted to $190,000.

The Peabody Institute Library, Baltimore, is one of the best examples of the old conventional buildings, which for many years seemed to be the fixed type and model of what a good library should be.

The great hall (Fig. 130) is 84 feet by 70 feet, and 61 feet in height. Adjoining it, at one end, is a reading-room, 72 feet by 36 feet, and at the other, work-room, librarian's office, elevator, and staircase. The large central hall is divided into seven alcoves on either side by double cases 18 feet in length. They are six storeys in height, the bottom one being 9 feet high, and the others 8. The upper alcoves are reached from staircases placed one at each corner of the room. Light is obtained from two small windows in each alcove, and a skylight covering the whole of the centre of the room. The bookcases will hold about 150,000 volumes, and a second row of double cases may be placed in each alcove, which will materially increase the shelf capacity of the room.

In Chapter I. consideration has already been given to the wastefulness of this style of library building, and nothing more need be said here upon that point. It should, however, be mentioned that this is a favourable example of the type of building.

The alcoves are all floored over, and have no separate heating apparatus, so they do not get over-

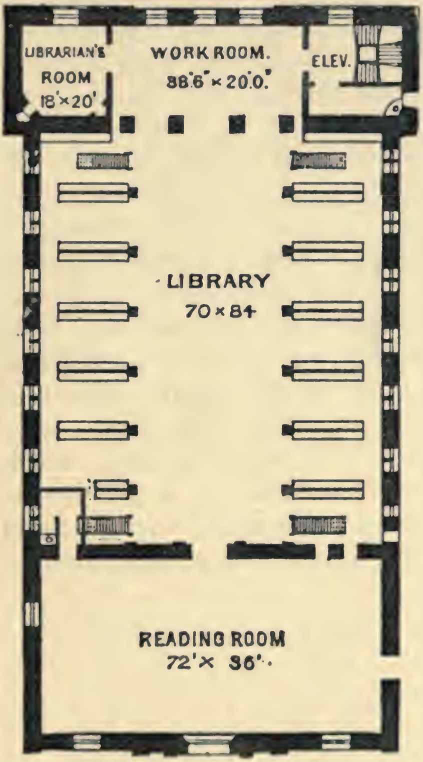


FIG. 130.—Ground plan of the "Peabody" Institute, Baltimore.

heated, as in other libraries of similar construction. The St. Louis Mercantile Library reported, for example, that when the temperature 1 foot from the floor was 64 degrees, it was 74 degrees 10 feet above, and 82 degrees 19 feet above. Of the Cincinnati Library it is similarly reported that when the temperature 6 feet from the floor was 65 degrees, it rose to 124 degrees in the upper gallery.

The skylight portion of the centre of the hall is domed, and about 15 feet higher than the highest alcove ; no doubt this helps to keep the alcoves cool, as the hot air would naturally ascend to the centre first, and there escape through the exits. The provision of a separate reading-room, instead of placing the readers at tables in the open centre of the library hall, is much more conducive to their comfort, although it increases greatly one defect of this kind of building, viz., the distance the attendants have to travel for some of the books required.

The cost of the entire building, which includes a conservatoire of music, a gallery of art, and lecture-rooms, was $517,000 ; the cost of the library portion is reckoned at $342,000.

CHAPTER XIII

EUROPEAN LIBRARIES: BIBLIOTHÈQUE NATIONALE ET SAINTE GENEVIÈVE (PARIS), THE STATE LIBRARY (FRANKFURT), UNIVERSITY LIBRARIES AT HALLE AND LEIPZIG, IMPERIAL LIBRARY (STRASSBURG), WOLFENBÜTTEL, VALLIANO LIBRARY (ATHENS)

THE French National Library is contained in a congerie of buildings at the corner of the Rue de Richelieu and the Rue Neuve des Petits Champs. Part of the edifice was built by Cardinal Mazarin; but so many alterations have been made since, that but little is left of the ancient erections.

The main entrance is in the Rue de Richelieu, and leads to an inner open court, called the "Cour d'Honneur." On the right of the court is a vestibule, which gives access to the large reading-room, named the "Salle de Travail" (Figs. 131 and 132), which was built by M. Labrouste, the architect of the Bibliothèque St. Geneviève. It is a fine room, 43 metres[1] in length, 34 in breadth, and 200 metres high, accommodating 344 readers, who are seated at flat-topped tables, a space 1 metre in breadth, about two-thirds of that allotted at the British Museum, being allowed to each person. The north

---

[1] A French metre is almost exactly 3 English feet 3 inches.

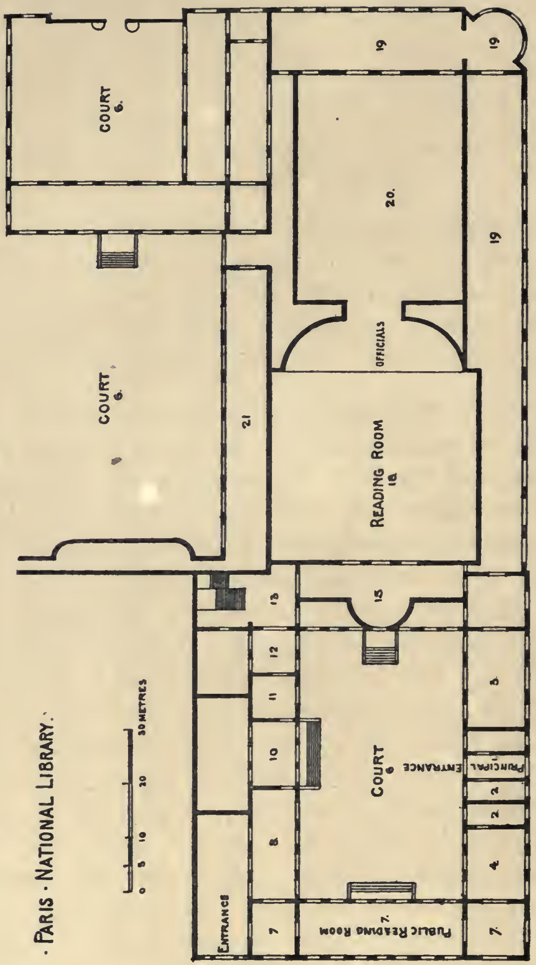


Fig. 131.—Ground floor plan of the National Library, Paris.

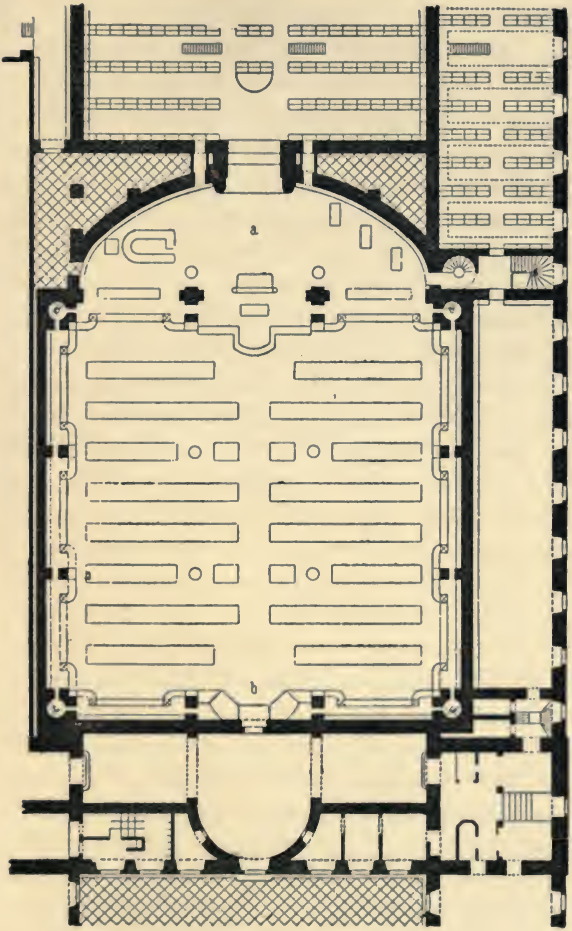


FIG. 132.—Reading-room of the National Library, Paris.

end is semicircular in shape, and is railed off for the attendants and catalogues, a door in the centre giving access to the "Magasin central des imprimés," or stack-room, which is shelved with cases five storeys in height. The interior of the reading-room is very fine. It is about 60 feet high, and is covered with an iron roof supported by sixteen cast iron columns. The construction of the ceiling is bold. Iron girder arches spring from column to column, and the dome surfaces are covered with glazed terra-cotta, fastened with bands of iron, the mode of construction showing inside. The room is divided into nine bays by the columns, a spherical cupola being over each. Light is admitted through semicircular windows in the north wall, and through lantern lights in the domes and the glass roof of the hemicycle. The side arches are filled with bookcases, which are three tiers in height, and are reached by galleries approached by staircases in the corners of the room.

In the first storey of the building, facing the Rue de Richelieu, are rooms for the "Cabinet des Médailles" and the more valuable manuscripts; and on the Rue Colbert side is a public reading-room, the "Magasin pour les Journaux."

The administrative parts of the library are at the side of the "Cour d'Honneur." Access is gained to them through a vestibule, in which is placed portions of the wainscot of the old "Cabinet des Medailles," the panels painted by Boucher, and some royal portraits from the old buildings.

In the Mazarin gallery rare MSS. and books are exhibited, and beyond it is the residence of the administrator, a hall for lectures, bookbinding rooms, rooms for photography, and the "Department des cartes et la Géographie."

In the stack-rooms the books are shelved in wooden cases five storeys in height, each case being 2½ metres. The floors are of open iron work, and in order to admit as much light as possible, are not taken close up to the cases, a distance of about 6 inches being left on either side, covered with wire-netting to catch any books that may be accidentally dropped upon them. The shelves are wooden, and rest upon brass pins screwed into holes in the uprights of the cases.

A plan of the ground floor of the whole building is shown in Fig. 131, from which the general arrangement of the rooms may be seen. The buildings on the vacant left hand corner have recently been taken down, and it is anticipated that a reading-room for lighter reading and magazines will be erected upon it.

The library of St. Geneviève was rebuilt in 1850, from the designs of M. Henry Labrouste. It is rectangular in form, with the principal façade occupying one of the longer sides. The building is 285 feet long by 90 feet wide. The whole of the first floor is taken up with a large reading-room, the edifice being only one storey in height. The south and principal frontage is pierced with thirty-seven arched windows in two rows; the intervals between are filled with panels, on which are inscribed the names of 810 writers of all nations, arranged in chronological order. The principal entrance is in the centre of the south side, and projects from the main building. The vestibule gives admittance to a large central hall, and from this, on the right, the department of manuscripts and drawings is approached, and on the left that of the printed books. Each of these two large rooms is further divided by a central division into two parallel rooms, with a third running transversely across the building at either end.

A grand staircase leads from the entrance-hall to the reading-room on the first floor. It is of striking appearance. It is divided into two main aisles by sixteen iron columns in the centre, standing on piers, and carrying the arched iron roof. The books are contained in cases around the wall, four metres in height, with galleries approached by staircases in each corner of the room. The librarian's desk is in the centre of the room, and faces the entrance doors. The tables for readers are arranged in two rows on either side. There are fourteen in all, each seating 34 persons, and so accommodate 476 readers. The tables in the manuscript and book rooms underneath seat a similar number. The rooms on the ground floor are 7 metres in height, and the large reading-room is 15 metres at its highest point.

The building was erected at a cost of £75,000, and houses the oldest public library in France. The following inscription on the staircase gives its history in a few words :—

"Bibliothèque Sainte Geneviève, fondée par les Génovéfains en 1626, devenue propriété Nationale en 1790 : transférée de l'ancienne Abbaye dans cet édifice en 1850."

The Stadtbibliothek at Frankfurt was erected in 1892, from the plans of Messrs. Müller & Wolff. It covers an area of 2200 square metres, and has accommodation for about 500,000 volumes. Like most of the modern German libraries, the administrative portion of the building is in the centre, with book-stores in projecting wings on each side.

A large entrance-hall in the centre of the main building gives access to a waiting room and rooms for officials on either side, with a grand staircase the whole width of the hall facing the entrance. The librarian's office forms the corner room at one end of the building, and the catalogue room is in the corresponding room at the other end. On the first floor over the entrance-hall is the reading-room, with seats for thirty readers, and small rooms for the reception of the numismatic collection, and for bookbinding. Two small book-stores occupy the end rooms of this central part.

The large book-stores in the wings are entirely separated from the central block of the building by thick fireproof walls. The only connection is one doorway on each floor. The book-stores are 50 feet by 38, and have windows on either side. The bookcases are five storeys in height, and are placed at right angles to the outer walls. They are reached by flights of straight stairs in the centre of the rooms, and lit by large side windows, so placed as to allow the light to fall between each case. A small skylight runs from end to end of each store over the centre of the room, and gives a good light to the stairs. The bookcases are 2 feet 6 inches from back to front, and have gangways between them 6 feet 6 inches in width. The cases are divided into four equal divisions for shelves 3 feet 4 inches in length. Fig. 133 gives the plan of the ground floor, and Fig 134 that of the upper.

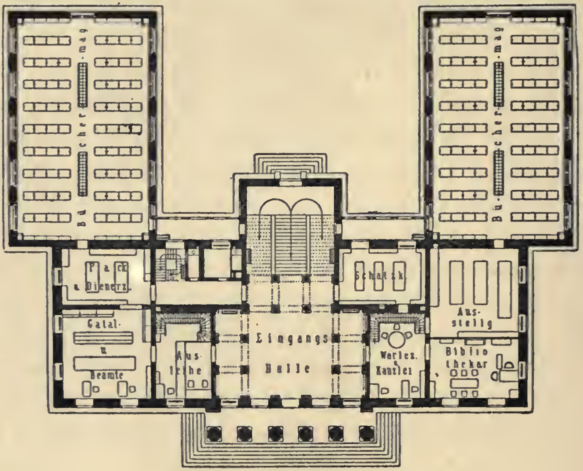


FIG. 133.—Ground floor plan of the State Library, Frankfurt.

The University Library at Halle occupies a corner site, with light on all four sides, and is a good example of a compact library built upon a small site. It was erected from the design of Herr

Tiedemann in 1880, and is four storeys in height. There is no basement, except a small portion used for the heating apparatus; but there is a small chamber under the whole building to give ventilation, and so prevent damp rising to the books.

The entrance is in the centre of the shortest side, as shown in Fig. 135, and the hall gives access to a staircase of granite placed right in the centre of the building. This goes to the top, and is lit by a skylight in the roof. On the right of the entrance-hall are porters' rooms, and rooms for the exhibition of engravings, manuscripts, and incunabula. On the left are rooms for the Oriental manuscripts, with a part of the book-store at the back, the latter being

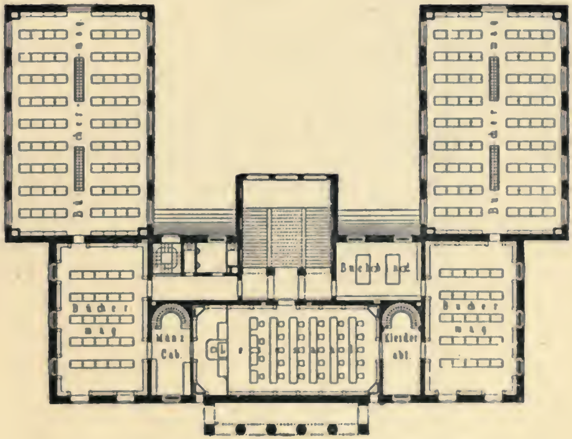


FIG. 134.—First floor plan of the State Library, Frankfurt.

entirely cut off from the front portion of the building by a wall from side to side, the only communication being an iron door at the back of the staircase.

The first floor contains a reading-room, rooms

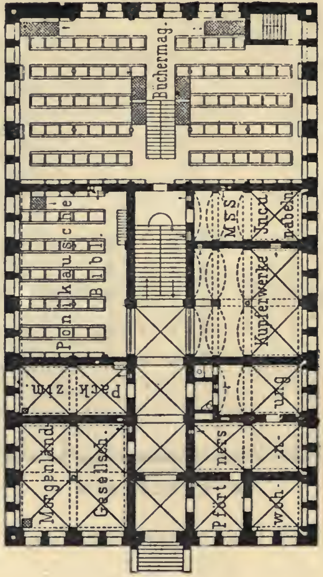


FIG. 135.—Ground floor plan of the University Library, Halle.

for the librarian, and a further portion of the book-store. The two top floors are entirely devoted to book storage, and have four tiers of bookcases, each floor containing two. In the centre of the book-store is placed an iron staircase which runs from the top of the building, and gives easy access to the various floors. A description of the construction of the iron bookcases will be found on pages 57–60, and details of the construction are shown in Figs. 14, 15, and 18.

In the corner of the building a narrow flight of stairs has been built, entirely enclosed by brickwork, except for one iron door on each storey. This is only for use as an emergency exit from the building in case of fire. It is a wise provision, and something of the kind should be provided in all buildings over three storeys in height.

The cost of the building and fittings was £18,750, and the shelf room is estimated to be sufficient for over half a million volumes.

The new building of the University Library at Leipzig is admirably planned for the special work it has to do. Reference to Fig. 136 will show that it occupies a parallelogram, and the entrance is placed in the centre of one of the longest sides. On the right hand side of the large inner hall is a reading-room for periodicals and journals, with a corresponding room on the left, used as a general office for inquiries. The large reading-room is at the back of the hall, and is semicircular in shape; it seats two hundred readers, each having four feet frontage of desk. The books are shelved in stores, which are placed at right angles to the reading-room, and also form the extreme wings of the building. They are well lit by windows placed between each case, and opening on the inner sides into a square area in each wing, one on the outer sides, to the open air.

Shelving is provided for about 800,000 volumes, and the accommodation can be increased by continuing the wings out to the same distance as the reading-room. In the front of the building are a students' room, and rooms for manuscripts and incunabula, with the librarian's office and catalogue room. A notable feature of the building is an arcade, which runs round the semicircular half of the reading-room. The books most in demand are shelved there in bookcases placed at right angles to the outside walls, so forming radii of a circle. The building was erected in 1888-91 from the designs of Herr Rossbach, at a cost of about £75,000.

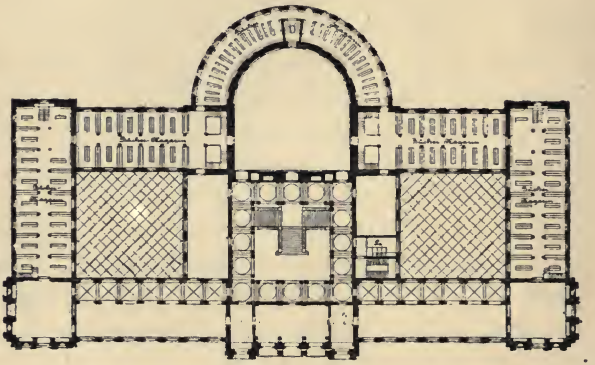


FIG. 136.—Ground floor plan of the University Library, Leipzig.

The new library at Strassburg, which replaces the building damaged during the siege of 1871, stands upon the north-eastern corner of the Kaiserplatz. It was designed by Messrs. Hartel and Neckelmann, and was opened in the October of 1895.

It is a fine, handsome building of white sandstone, in the Italian Renaissance style, and covers an area of 3320 square metres. The plan of the ground floor is given in Fig 137, and a section through the building in Fig 139. It will be seen that the entrance is in the middle of the frontage, and that the large interior hall gives access by a short corridor on either side to two staircases which lead to the first floor. Directly facing the hall is the "Bucher Ausleihe" or book-lending room, 17 metres by 8, and lit from the roof. It is a lofty room, with two book galleries around it. The reading-room is directly behind the lending room, and is 17 metres square. It has seats for eighty readers, of which ten are reserved for special study, each reader being allowed a desk space of one metre. This room is directly under the large dome which dominates the building, and is lit from it, and also by three large semicircular windows high up on each side. There are three galleries to this room, with bookcases 7 feet 4 inches in height in each. The total shelf capacity is about 53,000 volumes. On either side of the book-lending room, and at the back of the stairs, are two rooms of similar size; that on the right contains the catalogue, and that on the left, which seats twelve persons, is used for the study of manuscripts.

The three large stack-rooms occupy the back of the building and the greater portion of the two wings. They are connected with the reading-room by three shorter stack-rooms, which open directly into the centre of its north, south, and east walls.

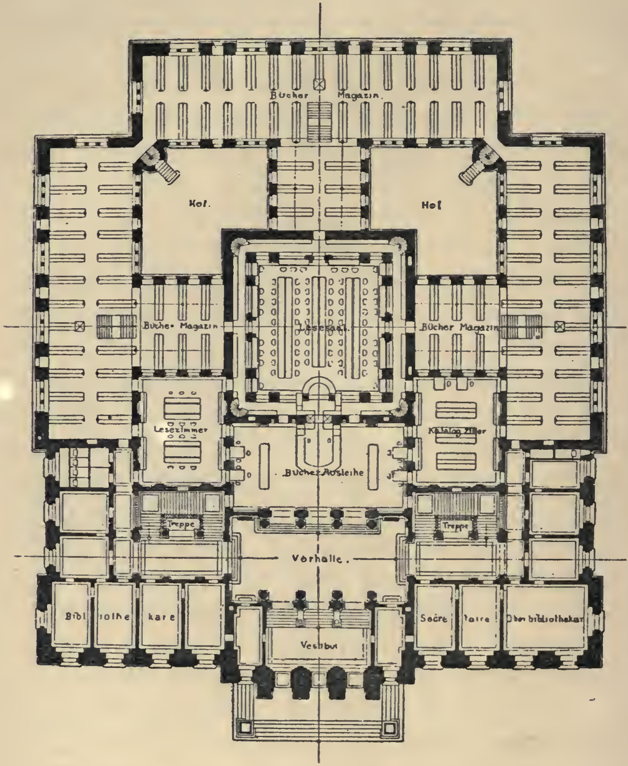


FIG. 137.—Ground floor plan of the Imperial Library, Strassburg.

The stack-rooms are 28 feet wide, and have a gangway running through the centre 4 feet 6 inches wide.

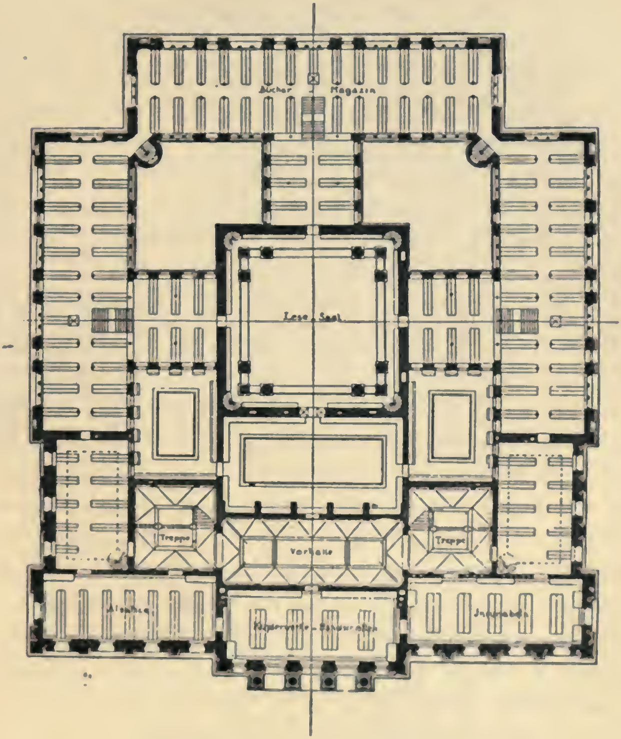


FIG. 138.—First floor plan of the Imperial Library, Strassburg.

The bookcases are of iron, and are five storeys in height in the connecting rooms, and eight storeys in the outer and larger book-stores, one storey in each case being below the level of the reading-room floor. The cases are 7 feet 6 inches in height, and are well lit, as each is placed at right angles to a window. Access to the different storeys is obtained by straight flights of staircases in the centre of each book-store, and at the back of each staircase is an electrical lift. Hanging electric lamps are placed between each bookcase, which can be switched on as wanted and moved for some six feet in either direction. There is also an electric railway running from the book-stores to the issue desk for the conveyance of the books.

The administrative portion of the building is entirely in the front. On the right of the vestibule, on the ground floor, are offices for the secretary and chief librarian, and on the left four rooms for the assistant-librarians. On the first floor (Fig. 138), over the vestibule and offices, are a noble suite of rooms, in which are displayed prints and manuscripts, incunabula, and a special collection of works appertaining to the antiquities and bibliography of Alsace. In the basement of the front portion of the building is located the heating apparatus, rooms for caretaker, &c. The reading-rooms and administrative portion of the building are kept at a temperature of 68 degrees, and the book-stores at that of 50 degrees.

The cost of the building was £70,000, and of the furniture and bookcases £14,250. The stock at the present time is estimated at 700,000 volumes, and the shelving capacity of the whole building is for over a million.

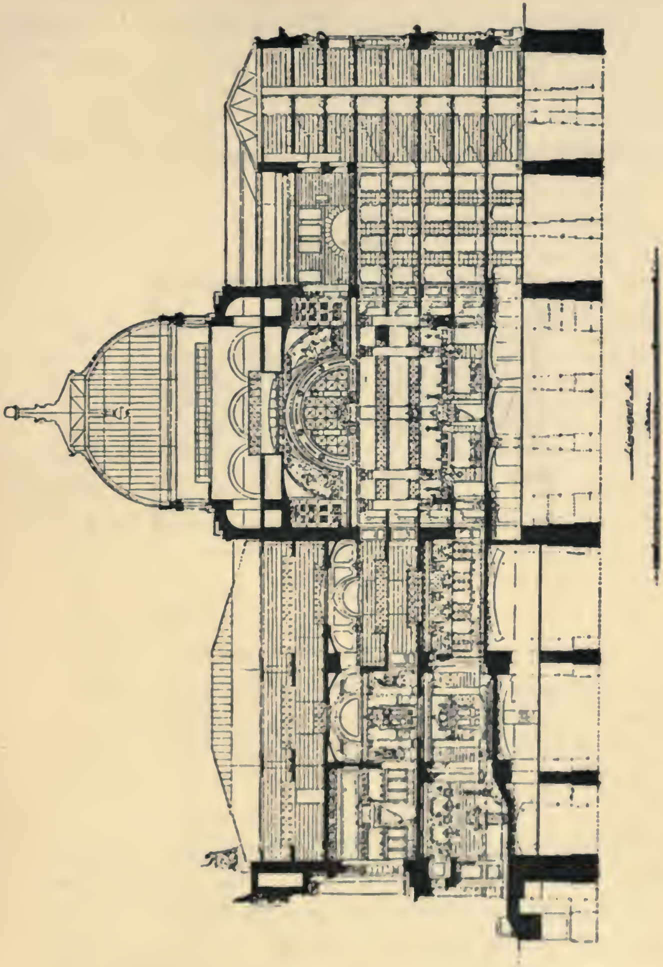


FIG. 139.—Section through the Imperial Library, Strassburg.

The new library at Wolfenbüttel is somewhat similar in construction to that of Leipzig. It was built in 1882–85, from the designs of Messrs. Müller and Bohnsack. Fig. 140 gives the disposition of the rooms upon the ground floor. The centre of the building is given up to a large gallery, used for the display of early printed books, prints, bindings, and other objects of art. The grand collection of Bibles is kept separate from the other books, and is stored in a room by itself.

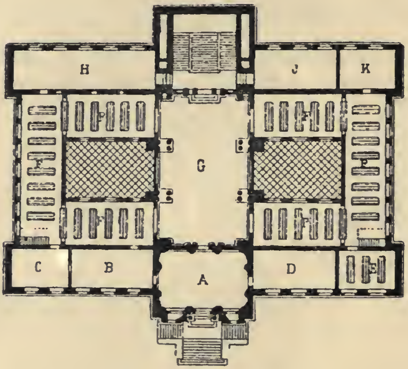


FIG. 140.—The new library at Wolfenbüttel.

A. Entrance.
B. Registration office.
C. Librarian.
D. Reading-room.
E. Periodical room.
F. Book-stacks.
G. Exhibition gallery.
H. Manuscripts.
J. Bible room.
K. Map room.

It has been already mentioned that the old library at Wolfenbüttel was built in 1710. A plan of it is given in Fig. 2, for it is interesting as showing the construction of one of the most celebrated of the early libraries. The structure was circular, and surrounded by a parallelogram. The centre was lit by a lantern supported on twelve massive pillars, the bases of which were surrounded by bookcases, the circular walls being also encased on both sides. The outer walls of the building were 150 feet by 110, and in each of the four corners an odd-shaped room was formed for catalogues, manuscripts, and other rarities. The outer part of the building was three storeys high, access being gained by a staircase in the entrance-hall.

The public library at Athens was erected in 1892, from the plans of Mr. George Hansen, the building, which cost £100,000, being the gift of a wealthy merchant named Valliano. The ground plan of the library is simple. The reading-room extends from the entrance-hall to the back, and has on each side a large book-store, approached by a short corridor, running from the centre of the room.

In the façade the central part of the building is accentuated by being brought forward, and approached by winding steps, the book-stores on either side being kept well back and subordinated to it. The architecture is classical, and in keeping with the ancient buildings near it. The building is two storeys in height, the reading-room being on the first floor, and is approached through a colonnade of marble pillars and an entrance-hall. It is a noble room, 85 feet by 50, with a row of marble columns running around it, and supporting a stained glass roof. Behind the pillars are wall cases, with two galleries containing the books most

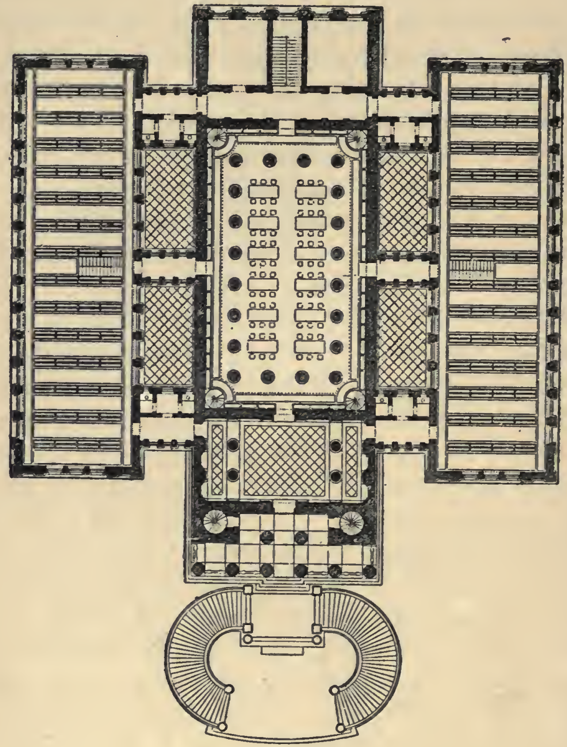


FIG. 141.—The "Valliano" Library at Athens.

in demand. It seats seventy-two readers at twelve tables. The book-stores are 120 feet by 32, and each contain fourteen bookcases, running across the stores with a gangway on either side. Each bookcase is 6 feet 7 inches in height, and there are five storeys of them, two being below the reading-room floor and three above. They are lighted by windows placed between each case, those on the interior walls opening into four small courts between the bookstores and the news-rooms. The shelving capacity of the library is about 400,000 volumes. The whole of the book-cases are of iron ; in fact, there is no wood used in the building, with the exception of the doors. Fig. 141 shows the disposition of the rooms on the first floor. The basement is only used for a porter's residence and storage purposes.

APPENDIX

APPENDIX

LIST OF ILLUSTRATIONS OF LIBRARIES appearing in the *American Architect*, from vol. 1, 1876, to vol. 51, 1896, with the names of the architects.

Vol.

1. Ottawa (Canada) Library of Parliament—*Fuller and Jones.*
3. Utica (N.Y.) Public Library—*Gouge.*
3. Bristol (Mass.) Public Library—*Earle.*
3. Orleans (Mass.), The Snow Library—*Cabot and Chandler.*
5. Hingham (Mass.) Public Library—*Thayer.*
6. Hingham (Mass.) Public Library—*Luce.*
7. New York, The Astor Library—*Stent.*
10. Billerica (Mass.), The Bennett Library—*Rotch and Tilden*
11. Newport (England) Public Library—*Watson.*
11. London, The Inner Temple Library—*Edis.*
11. Bridgewater (Mass.) Memorial Library—*Rotch and Tilden.*
13. North Easton, The Ames Memorial Library—*Richardson.*
13. Quincy (Mass.), The Crane Library—*Richardson.*
15. Watertown (Mass.) Public Library—*Shaw and Hunnewell.*
15. Lincoln (Mass.) Public Library—*Preston.*
16. Sketches of Paris Libraries—*Blackall.*
17. Hanover (N.H.), The Dartmouth College Library—*Thayer.*
17. Boston (Mass.) Public Library—*Competition plans.*
18. Malden (Mass.), The Converse Memorial Library—*Richardson.*
19. Washington (D.C.), The Medical Library—*Cluss and Schultze.*

Vol.

20. Burlington (Vt.), The Billings Library—*Richardson.*
20. Malden (Mass.), The Converse Library—*Richardson.*
20. Quincy (Mass.), The Crane Library—*Richardson.*
20. North Easton (Mass.) Public Library—*Richardson.*
20. Woburn (Mass.) Public Library—*Richardson.*
20. Somerville (Mass.) Public Library—*Loring.*
20. New York, The Lennox Library—*Hunt.*
20. Minneapolis (Min.) Library and Museum—*Warren.*
21. Allegheny (Pa.), The Carnegie Library—*Competition plans.*
22. Ottawa (Canada), Library of Parliament—*Fuller and Jones.*
22. Mexico, The National Library.
23. Boston (Mass.) Public Library—*M'Kim, Mead, and White.*
24. Washington, Library of Congress—*Smithmeyer.*
24. Richmond (U.S.) Memorial Library—*Cutler.*
24. Stockholm Royal Library.
25. Acton (Mass.) Public Library—*Hartwell and Richardson.*
25. Lexington, Memorial Library—*Polk.*
27. Paris, Library of St. Geneviève—*Labrouste.*
29. Middleton (England) Public Library—*Davies.*
29. Notting Hill (London) Public Library—*Figgis.*
29. Worcester (Mass.) Public Library—*Earle.*
30. Arlington (Mass.), The Robins Library—*Cabot.*
30. Bermondsey (London) Public Library—*Newman.*
33. New London (Conn.) Public Library—*Shepley.*
34. Brechin (Scotland) Public Library—*Farley.*
34. A public library—*Woollard.*
34. Translation of article on Libraries from the *Encyclopedie de l'Architecture et de la construction*, with many elevations, plans, and interiors of libraries.
35. Pittsburg (Pa.), The Carnegie Library—*Competition plans.*
36. Pittsburg (Pa.), The Carnegie Library—*Competition plans.*
36. Cambridge (Mass.) Public Library—*Van Brunt and Howe.*
38. Pittsburg (Pa.), The Carnegie Library—*Competition plans.*
39. Charlestown (N.H.), Public Library—*M'Alpine.*
41. New Orleans, The Howard Library—*Shepley.*

VOL.
42. Augusta (Me.), The Lithgow Library—*Aldrich.*
43. New Orleans, The Howard Library—*Shepley.*
44. Westminster (London) Public Library and Baths—*Smith.*
44. Edinburgh (Scotland), The Carnegie Library—*Browne.*
45. Augusta (Me.), The Lithgow Library—*Paulsen and Lavalle.*
46. Milford (Conn.), The Taylor Library—*Northrop.*
46. Worcester (England), The Victoria Institute—*Simpson and Allen.*
48. Chelmsford (Mass.), The Adams Library—*Fox.*
48. Providence (R.I.) Public Library—*Competition plans.*
48. Shelton (Conn.), The Plumb Library—*Beardsley.*
48. Washington, The Library of Congress.
48. Boston (Mass.) Public Library—*M'Kim, Mead, and White.*
49. Strassburg, The University Library—*Neckelmann.*
50. Fall River (Mass.)—*Competition plans.*
50. Hoboken (N.J.) Public Library—*Ross.*
50. Wrentham (Mass.), The Fiske Library—*Woodbury.*
50. Chicago (Ill.), The Virginia Library—*Shepley, Rutan, and Coolidge.*
50. West Ham (England) Library and Technical Institute—*Competition plans.*
50. Leipzig, The University Library—*Rossbach.*
51. Newton (Mass.), The Hills Library—*Kendall and Stevens.*
51. Wrentham (Mass.), The Fiske Library—*Woodbury.*

LIST OF ILLUSTRATIONS OF LIBRARIES appearing in the *Architect*, from vol. 1, 1869, to vol. 56, 1896, with the names of the architects.

VOL.
7. Blackburn Public Library—*Woodzell and Collcutt.*
12. Manningham, Airdale College—*Roger Smith.*
13. Design for a public library—*Marvin.*
17. Design for a public library—*Scott.*

VOL.
29. Design for a public library—*Lewis.*
30. Aberdeen, Anderson Free Library—*Pirie and Clyne.*
32. Belfast Public Library—*Richards.*
36. Design for a public library—*Stirling.*
44. Westminster Abbey Library roof.
46. Design for public library—*Woollard.*
52. Edinburgh, Solicitors of the Supreme Court Library—*Dunn.*
52. Edinburgh Public Library—*Browne.*
54. London, West Ham Public Library and Institute—*Four competition designs.*
55. London, West Ham Public Library and Institute—*Newman.*
55. London, South Audley Street Branch Library—*Bolton.*
56. Croydon Municipal Buildings and Library—*Henman.*

LIST OF ILLUSTRATIONS OF LIBRARIES appearing in the *British Architect*, from vol. 1, 1874, to vol. 45 1896, with the names of the architects.

VOL.
3. Blackburn Public Library—*Newman.*
6. Derby Public Library—*Holtom and Connon.*
6. Manchester, design for public library—*Armstrong.*
7. Soane medallion competition—*Mee.*
8. Newcastle-upon-Tyne Public Library—*Bryson.*
12. Derby Public Library—*Freeman.*
15. Didsbury Literary Institution—*Roper.*
17. Newport (Monmouth) Public Library and School of Science—*Watkins and Son.*
22. Rochdale Public Library—*Platt.*
22. Swansea Public Library—*Seddon and Carter.*
25. Hindley Public Library—*Worthington and Elgood.*
28. Edinburgh Public Library—*Browne.*
30. Edinburgh, Solicitors of the Supreme Court Library—*Dunn.*

VOL.

32. Middleton Public Library—*Booth.*
32. Edinburgh Public Library—*Browne.*
33. Chelsea Public Library—*Brydon.*
34. New London (U.S.A.) Public Library—*Shepley, Rutan, and Coolidge.*
36. Dublin, National Library—*Deane.*
37. Chelsea Public Library—*Brydon.*
39. Village Library—*Lamb.*
40. St. Giles Public Library—*Hayward and Harrison.*
42. Reading Public Library—*Cooper and Howell.*
43. Hampstead Public Library—*Champneys.*
45. Shoreditch Public Library and Baths—*Hannaford and Wills.*

LIST OF ILLUSTRATIONS OF LIBRARIES appearing in the *Builder*, from vol. 1, 1843, to vol. 72, 1897, with the names of the architects.

VOL.

11. Paris, St. Geneviève—*Labrouste.*
15. Paris, Conservatoire des Arts et Métiers—*Vandoyer.*
17. Canada, Library of the Parliament Buildings (Ottawa) —*Fuller and Jones.*
18. London, Middle Temple—*Abraham.*
28. London, Guildhall—*Jones.*
30. New York Mercantile Library—*Wight.*
33. Hereford Public Library—*Kempson.*
37. Derby Public Library—*Freeman.*
37. Sunderland Public Library—*Tilman.*
39. Sion House Library (Isleworth)—*Adam.*
40. Richmond Public Library—*Brunton.*
42. Melbourne Public Library—*Smith and Doyle.*
42. Oldham Public Library—*Tiltman and Shaw.*
43. Preston, The "Harris" Public Library—*Hibbert*
45. Huntly, The "Brander" Library—*Rhind.*
46. Belfast Public Library—*Deane.*

VOL.
47. Leeds Public Library—*Corson.*
49. Wimbledon Public Library—*Potts, Sulman, and Hennings.*
49. Hindley Public Library—*Worthington and Elgood.*
53. Edinburgh Public Library—*Two competition plans.*
53. West Norwood Public Library—*Smith.*
53. Lambeth, The "Tate" Library (South Lambeth)—*Smith.*
54. Kensington Public Library—*Stirling.*
55. Battersea Central Library—*Two competition plans.*
55. Chester Public Library—*Lockwood.*
55. Kennington, The "Durning" Library—*Smith.*
56. Battersea Central Library—*Lyon.*
56. Chelsea Central Library—*Three competition plans.*
57. Mile End, The People's Palace—*Robson.*
59. Wandsworth Public Library—*Smith and Gale.*
60. Chelsea Central Library—*Brydon.*
60. Oxford, Mansfield College—*Champneys.*
61. Ayr, The "Carnegie" Library—*Morris and Hunter.*
61. Uppingham School Library—*Jackson.*
62. Bermondsey Public Library—*Johnson.*
62. Lincoln Cathedral Library—*Wren.*
63. Uppingham School Library—*Jackson.*
64. Stoke Newington Public Library—*Runtz.*
65. Colchester Public Library—*Binyon.*
65. Walbeck Public Library—*Wilson.*
67. St. Helen's Institute and Library—*Horsley.*
67. Widnes Public Library—*Woodhouse and Willoughby.*
69. Hampstead Central Library—*Field.*
70. Columbia College (U.S.A.)—*M‘Kim, Mead, and White.*
70. West Ham Institute and Library—*Gibson and Russell.*
70. Cardiff Public Library—*Seward.*
71. Manchester, The Christie Library, Owens College—*Waterhouse.*
71. Manchester, The Rylands Library—*Champneys.*
71. London, Library of the Institution of Civil Engineers—*Barry.*
71. Shoreditch Public Library—*Wigg, Oliver, and Hudson.*
72. Bristol Branch Library—*Gough.*

LIST OF ILLUSTRATIONS OF LIBRARIES appearing in the *Building News*, from vol. 1, 1855, to vol. 72, 1897, with the names of the architects.

VOL.

3. British Museum Public Library—*Panizzi.*
3. Liverpool Public Library—*Allom.*
4. London Reform Club—*Barry.*
5. Venice, St. Mark's.
7. London, New Library, Inner Temple—*Abraham.*
16. Cardiff Library and Museum—
19. Salford Public Library—*Royle and Bennett.*
21. Cincinnati Public Library—*M'Laughlin.*
24. Blackburn Public Library—*Hoodzell and Collcutt.*
24. London, Grafton Street—*Chatfield Clarke.*
31. Derby Public Library—*Freeman.*
37. Leeds Public Library—*Corson.*
37. Ipswich Public Library—*Cheston, Binyon, and Bisshopp.*
38. Cardiff Public Library—*James, Seward, and Thomas.*
41. Oldham Public Library—*Mitchell.*
41. London, Inner Temple—*Edis.*
44. Newark-upon-Trent, Gilstrap Library—*Henman and Beddoe.*
45. Belfast Public Library—*Lynn.*
45. Munich Royal Library—*Gaertner.*
46. Design for a free library—*Doughty.*
46. London, Gray's Inn—*Isaac and Florence.*
47. Dublin, National Library—*Deane.*
48. Cambridge, Trinity Hall—*Adams.*
48. Manchester, Chetham Library.
48. Dublin, National Library—*Holme and Horneblower.*
49. Newcastle-under-Lyme Public Library—*Sugden, Blood, and Sugden.*
51. Folkestone Public Library—*Binyon.*
53. Poole, Dorset, Public Library—*Lawson and Donkin.*
54. Kensal Town Public Library—*Karslake and Mortimer.*

VOL.

55. Edinburgh, Solicitors of the Supreme Court Library—*Dunn.*
55. Vatican Library, Rome.
56. Chelsea Public Library—*Brydon.*
56. Clerkenwell Public Library—*Karslake and Mortimer.*
56. Lambeth, The "Tate" Library (South Lambeth)—*Smith.*
58. Chelsea Public Library—*Brydon.*
58. West Norwood Public Library—*Smith.*
58. Edinburgh Public Library—*Browne.*
58. Newark-upon-Trent—
58. Rochdale Public Library—
59. Aberdeen Public Library—*Browne.*
59. Belfast Public Library—*Lynn.*
59. Clapham Public Library—*I'Anson.*
59. Darlington, "Edward Pease" Public Library—*Hoskins.*
59. Clerkenwell Public Library—*Karslake and Mortimer.*
59. Edinburgh Public Library—*Browne.*
60. Battersea, Lurline Gardens—*Branch.*
60. Minneapolis Public Library—*Long and Kees.*
60. Camberwell, "Livesey" Library—*Whellock.*
60. St. Martin-in-the-Fields Public Library—*Walker.*
60. Streatham, The "Tate" Public Library—*Smith.*
60. West Norwood Public Library—*Smith.*
60. Edinburgh Public Library—*Browne.*
61. Ashton-under-Lyne Public Library—*Eaton.*
61. Brixton, The "Tate" Public Library—*Smith.*
61. St. George's Public Library (Buckingham Palace Road)—*Bolton.*
61. Southampton Public Library—*Guy and Smith.*
61. Stoke Newington Public Library—*Bridgman and Goss.*
62. Bermondsey Public Library—*Johnson.*
62. Croydon Public Library—*Henman.*
62. Newington Public Library—*I'Anson.*
63. Ayr, The "Carnegie" Public Library—*Campbell, Douglass, and Morrison.*
63. Lewisham Public Library—*Guy.*
63. Poplar Public Library—*Clarkson.*

VOL.

63. Whitechapel, The "Passmore Edwards" Public Library—*Potts and Hennings.*
64. Birmingham, Bloomsbury Branch Library—*Cossins and Peacock.*
64. Colchester Public Library—*Binyon.*
64. Shoreditch, The "Passmore Edwards" Public Library—*Lovell.*
64. Cambridge, St. John's College Library—
65. Camberwell Public Library—*Whellock.*
65. West Ham Public Library (Canning Town)—*Angell.*
65. Westminster Public Library—*Smith.*
65. Cardiff Public Library—*Seward and Thomas.*
66. Camborne, The "Passmore Edwards" Public Library—*Trevail.*
66. Falmouth, The "Passmore Edwards" Public Library—*Tresidder.*
66. Kilburn Public Library—*Edmeston and Gabriel.*
67. Barking Public Library—*Dawson.*
67. Kingston-upon-Hull Branch Library—*Cheers.*
67. Redruth, The "Passmore Edwards" Public Library—*Hicks.*
67. Walthamstow Public Library—*Williams and Dunford.*
67. St. Mary-le-Strand Public Library, Drury Lane—*Vicars.*
68. Camborne, The "Passmore Edwards" Public Library—*Trevail.*
68. Truro Public Library—*Trevail.*
68. Hammersmith Public Library—*Adams.*
69. Hammersmith Public Library—*Adams.*
69. Lower Edmonton Public Library—*Adams.*
69. Shoreditch Public Library—*Five competition plans.*
69. West Ham Public Library and Institute—*Four competition plans.*
70. Abingdon Public Library—*West.*
70. Bodmin, The "Passmore Edwards" Public Library—*Trevail.*
70. Hammersmith Public Library—*Adams.*
70. Hyde Public Library—*Woodhouse and Willoughby.*

VOL.

70. Shoreditch, The "Passmore Edwards" Public Library—*Four competition plans.*
70. Liskeard Public Library.
70. Nunhead Public Library—*Whellock.*
70. St. Ives Public Library—*Symons.*
70. Newcastle-upon-Tyne, The "Stephenson" Library (Elswick)—*Dyson.*
71. Boston (Mass.), The Old West Church Library—*Benjamin.*
71. Dulwich, The "Passmore Edwards" Public Library—*Barry and Son.*
71. Widnes Technical Institute and Library—*Woodhouse and Willoughby.*
72. Edmonton, The "Passmore Edwards" Public Library—*Adams.*
72. Shadwell, The "Passmore Edwards" Public Library—*Adams.*

INDEX

INDEX

ABBEY (Edwin A.), cartoons of the "Quest of the Holy Grail" at Boston Public Library, 239
Aberdeen Public Library:
  Arrangement and plan, 141
  Method of indicator work, 80
  System of mechanical ventilation, 37
Aberdeen University Library:
  Shelf fittings, 53
Adams (Maurice B.), architect of the Edmonton and Hammersmith Public Libraries, 211
Alcove system of shelving, *see* Shelving
Allom (T.), architect of the Liverpool Free Library, 167
American Libraries, *see* Baltimore, Boston, Brooklyn, Buffalo, Chicago, Cornell University, Milwaukee, Minneapolis, New York, and Washington
Amherst College Library:
  Arrangement of shelving, 48
Amsterdam University Library:
  Construction of iron floor of book-stores, 64
Archer (William), suggestions for library buildings, 153
Athenæum newspaper file, 113
Athens, the Valliano Library:
  Arrangement and plan, 311
Atwater newspaper file, 113

BALTIMORE, Peabody Institute:
  Arrangement and plan, 10, 290
Banbury newspaper file, 115
Barrett (F. Thornton), inventor of the first indicator, 73
Barrett's book support, 102, 104
Barry (Sir Charles), plan for the extension of the British Museum, 138
Bates Hall, *see* Boston Public Library
Battersea Central Library:
  Arrangement and plan, 194
  Card-catalogue, 88
Beaumont (J. W. and R. F.), architects of the Gorton and Openshaw Libraries, 174
Baber (Henry H.), librarian of the British Museum, 136
Belfast Public Library:
  Architectural account, 142
Bermondsey Public Library:
  Architectural account, 197
Bethnal Green Library:
  Sliding press, 65
Birmingham Public Libraries:
  Architectural account of the central library, 144
  Branch lending libraries and news-rooms, 145
  Issues and stock at the central library, 7
Bishopsgate Institute, London, 198
Blackburn Library and Museum:
  Architectural account, 147
Bodleian Library, Oxford, 3
Bolton (Albert J.), architect of the St. George's Library, 227
Bolton Central Library, issues and stock, 7
Bonner's indicator, 86
Bookcases, *see* Shelving
Book-lifts, 104
Book-railway in use at the Library of Congress, 105, 261
Book-railways at the Boston Public Library, 250
Book-supports, 100

Book-trucks in use at the British Museum and Göttingen, 96
Books, sizes of, 40
Bootle Library and Museum:
  Arrangement and plan, 148
Boston Public Library:
  Architectural description and plans, 239
  Decoration of the public rooms, 15, 245
  Height of bookcases, 40
  Height of book-stacks, 43
Bowry newspaper file, 112, 115
Brackets, *see* Shelving
Bradford Public Library:
  Sliding press invented by Virgo, 65, 71
Braithwaite Hall, Croydon, 206
Briggs and Wolstenholme, architects of the Gamble Institute, St. Helens, 182.
Bristol Branch Library at St. Philip's, 150
British Museum, London:
  Architectural history of the Museum, 128
  Book-lift and carrier, 104
  Book-truck, 96
  Desks and tables for readers, 107
  Electric lighting, 29, 30
  First catalogue published in 1787, 131
  Heating and ventilation, 32
  Height of bookcases, 40
  Height of book-stacks, 43
  Shelving and sliding press, 64
  Special shelving for folios, 68
Brixton Library, *see* Lambeth
Brooklyn, Pratt Institute:
  Arrangement and plans, 284
Brown (Alexander), architect of the Aberdeen Public Library, 141
Brown (Sir William), donor of the Liverpool Free Library, 167
Browne (G. Washington), architect of the Edinburgh Public Library, 158
Brussels Royal Library:
  Description of ladder in use, 118
Brydon (J. M.), architect of the Chelsea Central Library, 200
Buckingham House proposed as site for British Museum, 130
Buffalo Library:
  Arrangement and plan, 269
Bulletin boards and frames, 92
Burgoyne's newspaper fastener, 125

CABLE book-carrier at the Library of Congress, 105, 261
Camberwell Central Library:
  Plan of the, 199
Cambridge, Trinity College Library, 10
Card-catalogues, 87
Cardiff Central Library, issues and stock, 7
Carnegie (Andrew), donor of the Edinburgh Library, 162
Carysfort (Lord), fire in the library of, 24
Casey (T. L.), joint-architect of the Library of Congress, 257
Chairs for news-rooms, 116
Chelsea Central Library:
  Architectural account of the, 200
  Cost of electric lighting, 29
Cheltenham Public Library:
  Architectural account, 150
Chicago, the Newberry Library:
  Arrangement and plan, 267
Chivers' library appliances, *see* Library Bureau
Clapham Public Library:
  Architectural account of the, 204
Clarkson (J. and S. F.), architects of the Poplar Public Library, 226
Clerkenwell Public Library:
  Arrangements and plan, 205
Cotgreave (A.), library appliances:
  Automatic and other steps, 98
  Indicators, 76
  Magazine and periodical racks, 110
Congress, Library of, Washington:
  Architectural account and plans, 257
  Cable book-carrier, 105, 261
  Height of book-stacks, 43
Copyright Acts of A.D. 1774, 1814, and 1842, 132
Cornell University Library, Ithaca:
  Arrangements and plans of the, 274
Cossins and Peacock, architects of the Saltley Library, 146

Crocker book-brace and support, 100
Croydon Central Library:
  Arrangements and plan, 206

DARLINGTON, Edward Pease Library:
  Architectural account and plan, 151
  Ventilation and lighting, 28
Deane (Sir Thomas), architect of the National Library, Dublin, 156
De Chavannes (Puvis), painter, work of, in Boston Public Library, 15, 246
Decoration of libraries, 15, 257
Delessert (Benjamin), plan for rebuilding the French National Library, 138
Derby Library and Museum:
  Arrangement of public rooms, 146
Desks, *see* Tables and Desks
Dewey (Melvil) on height of bookcases, 40
Dublin, National Library of Ireland:
  Architectural account and plans, 153
  Arrangement of bookcases and storerooms, 156
Dundee Free Library, lighting of, 26
Duplex indicator, 80
Dusting machine, 125
Dyson (John W.), architect of the Stephenson Library, Elswick, 181

EASELS for folios and copying, 120–122
Edinburgh Public Library:
  Architectural account and plans, 158
  Electric lighting, 162
Edmonton Public Library:
  Arrangement and plans, 211
Eidlitz (C. L. W.), plan of the Buffalo Library, 269
Electric lighting, *see* Lighting
Elliot indicator, 74
Elswick Library, *see* Newcastle-upon-Tyne
European Libraries, *see* Athens, Frankfurt, Greifswald, Göttingen, Leipzig, Halle, Paris, Strassburg, Wolfenbüttel

FENTON system of book-shelving, 57
Fergusson (James) on the extension of the British Museum, 137
Ferry and Clas, architects of the Milwaukee Library and Museum, 279
Fires in libraries, 19, 24, 47
Floors of iron and glass for bookstores, 60, 64
Floors of wood and stone for the public rooms, 24
Florence, Biblioteca Laurenziana, 1
Follini (Vincenzo), librarian of the Magliabecchian Library, 5
Fontana (Domenico), architect of the Vatican Library, 2
Forshall (Rev. Josiah), Secretary of the British Museum, 137
Fowler (A.), architect of the Newcastle-upon-Tyne Central Library, 177
Frankfurt, the State Library:
  Arrangement and plans, 299
Freeman (R. K.), architect of the Derby Free Library, 146
French (D. C.), designer of the bronze doors of the Boston Public Library, 243
Furniture for libraries and newsrooms, 95

GAMBLE Institute, *see* St. Helens
Garnett (Dr. Richard) introduces the sliding press into the British Museum, 65
Garnsey (E. E.), work of, at the Boston Public Library, 250
Gas, influence of, on bindings, 13
Gibbs (James), architect of the Ratcliffe Library, Oxford, 3
Gibson and Russell, architects of the West Ham Technical Institute, 237
Giessen University card-catalogue, 88
Glasgow Mitchell Library:
  Arrangements and plans, 163
  Cost of electric lighting, 30, 166
  Issues, and stock of books, 7

Magazine rack, 110-112
Precautions against fire, 23
Size of chairs and tables, 107
Gorton Library, *see* Manchester
Göttingen University Library:
Construction of bookcases, 62
Table-easel for folios, 121
Trucks for books, 96
Gough (W. V.), architect of the St. Philip's Library, Bristol, 150
Greifswald University Library:
Construction of bookcases and stack-room, 61
Guildhall Library, London:
Architectural description, 191
Card-catalogue, 88
System of shelving compared with book-stores, 10

HALIFAX (Lord), owner of Montague House, 130
Halle University Library:
Arrangement and plan, 300
Construction of bookcases and stack-room, 57, 63
Hammersmith Public Library at Shepherd's Bush:
Architectural account, 212
Hampstead Public Library:
Arrangements and plan, 216
Shelf fittings adopted, 53
Harris Library, *see* Preston
Hawkins (Edward) on the extension of the British Museum, 137
Hansen (George), architect of the Valliano Library, Athens, 311
Hartel and Neckelmann, architects of the Imperial Library, Strassburg, 305
Harvey's dusting machine, 125
Heathcote's newspaper-holder, 123
Heating libraries by hot water and steam, 13, 31, 33, 291
Henman (Charles), architect of the Croydon Municipal Buildings and Library, 206
Hooke (Robert), plan for rebuilding the British Museum, 129
Hoskins (G. Gordon), architect of the Edward Pease Library, Darlington, 151

I'ANSON (E. B.), architect of the Clapham Public Library, 204
Indicators for lending libraries:
Barrett's, 73
Bonner's, 86
Chivers', 82
Cotgreave's, 77
Elliot's, 74
Morgan's, 82
The Duplex, 80
Iron bookcases, *see* Shelving

JENNER (Henry) and the sliding book press, 65
Johnson (John), architect of the Bermondsey Library, 197
Jones (Sir Horace), architect of the Guildhall Library, 191
Jones (J. Winter), librarian of the British Museum, 136

KERSLAKE and Mortimer, architects of the Clerkenwell Public Library, 205
Knight (W. H.), architect of the Cheltenham Library, 150
Korb, architect of the old library at Wolfenbüttel, 3

LABROUSTE (Henry), architect of the Bibliothèque Nationale and the Bibliothèque St. Geneviève, 293
Ladders for libraries, 118
Lambert's library appliances:
Iron bookcases, 57
Magazine and newspaper frame, 91
Newspaper clips, 124
Lambeth Public Libraries:
Brixton, South Lambeth, North Lambeth, and West Norwood, 218
Display of card-catalogue, 88
Method of indicator working, 80
Lavatories, provision of, for public use, 19
Leeds Central Library:
Issues, and stock of books, 7
Lending department of public libraries, 16, 17
Leipzig University Library:
Arrangement and plan, 303
Librarian's office, situation of, 17

Library buildings:
  Accommodation to be provided, 8
  Size and shape of suitable sites, 5
Library Bureau fittings and appliances:
  Adjustable shelf fittings, 53
  Chivers' indicator, 82
  Chivers' newspaper-holder, 125
  Metal book supports, 103
  Newspaper and magazine racks and files, 111
  Shelf-pin, 52
  Steel book-stack, 56
  Step and handle, 100
Lifts, *see* Book-lifts
Lighting:
  Cost of electric light, 29
  Gas lighting, 31
  Size and shape of windows, 26
Liverpool Free Library:
  Architectural account and description, 167
  Bulletin board and frame, 92
  Electric lighting of reading-rooms, 29
  Issues, and stock at central library, 7
  Shelf support for folios, 102
  Shelving for folios, 69
London Public Libraries:
  Architectural accounts of—
    Battersea, 195; Bermondsey, 197; Bishopsgate, 198; British Museum, 128; Camberwell, 199; Chelsea, 200; Clapham, 204; Clerkenwell, 205; Croydon, 206; Edmonton, 211; Guildhall, 191; Hammersmith, 212; Hampstead, 215; Lambeth, 218; Poplar, 226; St. George's, 227; St. Martin's, 231; Streatham, 232; West Ham, 233; Westminster, 237
Long and Kees, architects of the Minneapolis Public Library, 272
Lynn (W. H.), architect of the Belfast Public Library, 142

M'Kim (Charles F.), architect of the Boston, U.S.A., Public Library, 239
Magazine racks, *see* Racks
Magnusson (E.), suggestions for a library building, 138
Manchester Public Libraries:
  Central library inadequately housed in the old Town Hall, 171
  Gorton branch library, 172
  Issues and stock of central library, 7
  Lending library system, 17
  Openshaw municipal buildings and library, 174
Mannheim Castle Library, 3
Marlborough metal book supports, 101
Miller (W. H.), architect of the Cornell University Library, 274
Milnes (Monckton) and the galleries of the British Museum, 137
Milwaukee Library and Museum:
  Arrangements and plan, 279
Minet Library floor of oak blocks, 25
Minneapolis Library:
  Arrangement and plan, 272
Mitchell Library, *see* Glasgow
Montagu (Basil) and the Copyright Acts, 132
Montague House bought as home for the British Museum, 130
Morgan's indicator, 82
Mountford (E. W.), architect of the Battersea Central Library, 194
—— Architect of the Technical Schools, Liverpool, 167
Müller and Bohnsack, architects of the new library at Wolfenbüttel, 310
Müller and Wolff, architects of the Frankfurt State Library, 299

New York Mercantile Library:
  Arrangement and plan, 261
Newcastle-upon-Tyne Library:
  Arrangement and plan, 177
  Cost of electric lighting, 29
  Ladders, 118
  Table-easel for folios, 120
  Tables in reference library, 107
  The Stephenson Library at Elswick, 180
Newspaper racks and files, *see* Racks and files
Newspaper stands and holders, 120

Norwood Library, *see* Lambeth
Nottingham Central Library:
    Issues, and stock of books, 7

Open access systems of issue:
    Clerkenwell, 205
    Croydon, 210
    Worcester, 187
Openshaw Library, *see* Manchester
Ornament, *see* Decoration
Oxford, Bodleian and Radcliffe Libraries, 3

Panizzi (Sir A.), plans for the extension of the British Museum, 136, 138
Paris Libraries:
    Bibliothèque St. Geneviève, 297
    National Library of France:
        Arrangements and plan, 293
        Dangers from fire, 21
        Height of bookcases, 40
        Shelving for folios, 69
        Table-shelf for stack-room, 70
Passmore Edwards (John), libraries built by, *see* Edmonton, and Hammersmith
Peabody Institute, Baltimore, *see* Baltimore
Pease Library, *see* Darlington
Periodical racks, *see* Racks
Photographic studio in the Boston Public Library, 252
Photography in libraries, 93
Picton (Sir J. A.), Chairman of the Liverpool Library Committee, 167
Picton Reading-room, Liverpool, 169
Poole (Dr. W. F.), plans for a large library, 44, 267
Poplar Public Library:
    Arrangement and plan, 226
Powell Reading-room for Boys, Wigan, 187
Pratt Institute, Brooklyn, *see* Brooklyn
Preston, Harris Library and Museum, 181
Printing machines in use at the Boston Library, 255
Puget (Pierre), architect of the British Museum, 129

Quarterly Review on the Copyright Acts, 132

Racks for newspapers and magazines, 110
Radcliffe Library, Oxford, 3
Railways for transmission of books, *see* Book-railways
Reading-stands for newspapers, 120
Record Office shelf fitting, 52
Rome, Vatican Library, 1
Rossbach (Herr), architect of the University Library, Leipzig, 304

Sage (Henry W.), donor of new building for the library of Cornell University, 274
St. Gaudens (L.), sculptor, work of, in Boston Public Library, 244
St. George's, Hanover Square, Public Library:
    Arrangement and plan, 227
St. Gall Monastic Library, 3
St. Helens, Gamble Institute:
    Arrangement and plan of the library portion, 182
St. Martin-in-the-Fields Public Library, 231
Sansovino, architect of the Libreria Vecchia, Venice, 1
Santa's plan for a library building, 4
Sargent (John S.), work of, at the Boston Public Library, 253
Shelving and bookcases:
    Alcove system described, 10
    Book-stack of the University Library, Greifswald, 60
    Book-stores and shelving of the National Library of Ireland, 156
    Book supports, 100
    Comparative advantages of wood, iron, steel, and slate fittings, 49
    Construction of the shelving at the Buffalo Library, 270
    Construction of the shelving in the Minneapolis Library, 272
    Dr. Poole's plan for shelving a large library, 44, 46
    Galleries and shelving at the University Library of Göttingen, 62

  Height of bookcases, 39
  Method of calculating the book capacity of a room, 48
  Method of shelving employed in the Library of Congress, 259
  Methods of fixing shelves, 51
  Shelves for folio and quarto volumes, 42
  Sizes of books, 40
  Shelving in use at the University Library of Halle, 57
  Shelving of the British Museum Library, 64
  Sliding bookcases used in the British Museum, 65
  Stack system of shelving described, 11
  Steps for bookcases, 98
  Storerooms and shelving of the Pratt Institute, Brooklyn, 285
Sherlock (C.), architect of the Picton Reading-room, Liverpool, 169
Simplex indicator, 82
Simpson and Allen, architects of the Victoria Institute, Worcester, 187
Sites for libraries, 5
Sloane (Sir Hans), bequest of, to the nation, 128
Smith (F. J.), architect of the Westminster Public Library, 237
Smith (Sidney R. J.), architect of the Lambeth and Streatham Public Libraries, 222
Smithmeyer and Pelz, joint-architects of the Library of Congress, Washington, 257
Smirke (Sir Robert), architect of the British Museum, 133
Smirke (Sydney), and the new reading-room at the British Museum, 138
Statistics of the growth of libraries, 7
Stephenson Library at Elswick, Newcastle-upon-Tyne, 180
Steps for bookcases, 98
Stockholm National Library:
  Height of bookcases, 40
Strassburg Imperial Library:
  Arrangement and plan, 305
Strassburg University Library:
  Shelving for folios, 67
Streatham, the Tate Public Library:
  Arrangement and plan, 232
Stuttgart Royal Library:
  Arrangement and plan, 19
  Height of bookcases, 40
Supervision of public rooms, 18

TABLES and desks for readers, 105
Tate (Henry), libraries built by, *see* Lambeth, and Streatham
Tayler (Arnold S.), architect of the Hampstead Public Library, 217
Telephone and Telautograph for use in large libraries, 93
Tonks' shelf-fitting for bookcases, 51
Townsend (C. Harrison), architect of the Bishopsgate Institute, 198
Trucks, *see* Book-trucks

UMBRELLA stands for public use, 95

VALLIANO Library, *see* Athens
Venice, Libreria Vecchia, 1
Ventilation:
  General considerations, 31
  Mechanical system in use at Aberdeen, 37
  System in use at the Boston Public Library, 255
  Table for calculation of work done by a ventilating shaft, 36
  Ventilation and heating in alcove libraries, 292
Victor ladder, 119
Victoria Institute, *see* Worcester,
Vienna, Court Library, 3
Virgo (Charles), system of closed bookcases, 71

WALKER (Sir A. B.), donor of the Liverpool Art Gallery, 167
Walker's book-rack and slip-sorter, 117
Waterhouse (A.), architect of the Wigan Free Library, 185
Watts (Thomas) on the extension of the British Museum, 137
West Ham Technical Institute and Library, 233

Westminster Public Library:
  Arrangements and plan, 18, 237
Whistler (J. A. M'Neill), work of, at the Boston Public Library, 247
White wing of the British Museum, 139
Widnes Free Library:
  Arrangement and plan, 184
Wigan Free Library:
  Arrangement and plan, 185
  The Powell Branch Reading-room for Boys, 187
Windows, *see* Lighting
Wolfenbüttel Library:
  Arrangement and plan of the new building, 310
  Plan of the old building, 3
Woodhouse and Willoughby, architects of the Widnes Library, 184
Worcester, Victoria Institute and Library, 187

XYLONITE, use of, for protection of plates, 92

ZAEHNSDORF'S fireproof book covers, 24

THE END

Printed by BALLANTYNE, HANSON & Co
Edinburgh & London

UNIVERSITY OF TORONTO
LIBRARY

Do not remove the card from this Pocket.

Acme Library Card Pocket
Under Pat. "Ref. Index File."
Made by LIBRARY BUREAU

Lib.Sci
B

44284

Author Burgoyne, Frank J.

Title Library construction.

DATE.

NAME OF BORROWER